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ABSTRACT

Materials relating to the curriculum guide development phase of this project are presented in this volume of the report. Included are a definition of agribusiness competencies; a listing of occupational advisory committee members; rating forms showing the level of education appropriate for job preparation in the occupations covered by the guides; a complete listing of the 526 documents reviewed (by program areas), and summary results of the document review conducted to determine the state-of-the-art of existing guides and to identify elements for inclusion in the project-developed guides; a final report detailing the development and evaluation of the two guides on career awareness and career exploration which were prepared by Eastern Illinois University for grades K-6 and 7-9; a listing of the 104 conference participants representing 48 states at the national conference held in May 1974 for the purpose of disseminating the guides; and the conference agenda. (RG)

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APPENDIX A

Final Report

Project No. V257018
Contract No. OEG-0-72-4677

CURRICULUM DEVELOPMENT BASIC TO THE TRAINING OF INDIVIDUALS FOR EMPLOYMENT IN AGRIBUSINESS, NATURAL RESOURCES, AND ENVIRONMENTAL PROTECTION

Curriculum Development Project
in Vocational Education
Conducted Under
Part I of Public Law 90-576

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June 14, 1976

VOLUME TWO OF FIVE VOLUMES

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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A Definition of Agribusiness Competencies[1]

I. Summarized definition of agribusiness competencies.

Skills in and knowledge of 1) agricultural production - the production and propagation of animals (land and aquatic), animal products, plants (crops and ornamental), plant products, and forests and forest products; and the provision of services associated with agricultural production 2) the manufacture, distribution, and servicing of supplies used in agricultural production; 3) the designing, installation, repair, operation, and servicing of machinery, equipment, and power sources and the construction of structures and conveniences used in agricultural production; 4) the inspection, processing and marketing of agricultural products and primary byproducts; 5) aspects of greenhouse nursery, landscaping, and other ornamental horticultural operations; 6) the conservation, propagation, improvement, and utilization of renewable natural resources; and 7) the multiple uses of forest lands and resources.

II. Detailed definition of agribusiness competencies.

A. AGRICULTURAL PRODUCTION - Skills in and knowledge of the production of plants, animals, and their products.
   1. Animal science - Skills in and knowledge of the production of animals and animal products.
      a. Animal propagation and production - Knowledge of animals produced for food, fiber, and other purposes.
         1.) Animals produced for food and fiber - Knowledge of cattle, swine, sheep, poultry, fish (see also II.F.7. Fish), and other animals produced for food and fiber.
         2.) Other animals - Knowledge of pets, wildlife (see also II.F.4 wildlife), laboratory animals, and other animals produced and propagated for purposes other than food and fiber.
      b. Nutrition - Knowledge of the relationship of proteins, fats, carbohydrates, water, minerals, and vitamins in the production of meat, mild, eggs, and wood.
      c. Genetics - Knowledge of the principles of inheritance and their applications for the breeding and selection of animals.
      d. Physiology - Knowledge of the body processes and functions related to the production of animals and animal products (eg. lactation, reproduction, egg production, digestion, growth, and wool production).
      e. Animal health - Skills in and knowledge of the prevention and control of animal diseases and the treatment of injuries to animals.
      f. Production management - Skills in and knowledge of the operation and management of a farm, ranch, or other establishment involved in the production of animals and animal products.

[1]This definintion is based primarily on Subject-Matter Area 01 of Standard Terminology for Curriculum and Instruction in Local and State School Systems, Office of Education, U.S. Dept. of HEW

1.) Feeding practices - Knowledge of the "least cost" combinations of feed ingredients for achieving maximum quality and quantity in production.
2.) Housing practices - Knowledge of the housing and other environmental needs of specific kinds of animals.

g. Other animal science - Competencies, not elsewhere included, in the propagation and production of animals and animal products.

2. Plant science - Skills in and knowledge of the production of plants and the products derived from plants.
   a. Plant culture and production - Knowledge of plants for food, fiber, and other purposes.
      1.) Crops produced for food and fiber - Knowledge of cereal grain crops, fiber crops, forage crops, oil crops, tree fruit and nut crops, small fruit and berry crops, vegetable crops, and other crops produced for food and fiber.
      2.) Other plants - Knowledge of shrubs, trees, flowers, turf, and other plants cultivated and produced for ornamental, aesthetic, and other purposes except for food and fiber (see also II.E. ornamental horticulture); and forest trees and forestry products (see also II.G. forestry).
   b. Soils - Knowledge of the physical, chemical, biological, and fertility properties of soils in relation to their management for crop and other agricultural production operations.
   c. Nutrition - Knowledge of the nutrient and soil fertility requirements of plants.
   d. Genetics - Knowledge of the principles of inheritance and their applications for the breeding and selection of plants.
   e. Physiology - Knowledge of the life processes in plants and their implications in the production of plants and plant products.
   f. Plant disease and pest control - Knowledge of the symptoms, causes, and control of plant injuries and diseases; the impact and control of beneficial and harmful insects, nematodes, snails, mites, rodents, and birds in relation to agricultural production; and the control of undesirable forms of plant life.
      1.) Insecticides and rodenticides - Knowledge of the skills in the use of substances used to destroy or otherwise control harmful insects, rodents, and other plant pests.
      2.) Fungicides, bactericides, viricides, and nematocides - Knowledge of and skills in the use of substances used to destroy or inhibit bacteria, viruses, and other causes of plant diseases.
      3.) Herbicides - Knowledge of and skills in the use of compounds used to destroy or inhibit the growth of selected plants.
      4.) Nonchemical and other methods of controlling plant diseases and pests - Knowledge of biological, mechanical, cultural, and other methods of control.

g. Environmental biology - Knowledge of the interaction of plant life processes with factors of the environment, and their characteristics and implications for managing plant production.
h. Other plant science - Competencies, not elsewhere included, in the culture and production of plant and plant products.

3. Agricultural mechanics - (See II.C. agricultural mechanics).

4. Agricultural business management - Decision-making skills in and knowledge of production efficiency and resource analysis, accounting finance and other business management factors applied to agricultural production operations.
   a. Accounting - Skills in accounting including tax accounting as applied to agricultural production operations.
   b. Efficiency analysis - Skills in the use of performance records in determining and analyzing the efficiency of an agricultural production operation.
   c. Agricultural economics - Skills in budget analysis and the use of quantitative input-output relationships, costs, and price expectation to secure optimum economic returns for agricultural production operations.
   d. Manpower utilization - Decision-making skills in and knowledge of the economic use and management of labor resources.
   e. Purchasing and marketing - Skills in purchasing agricultural production input (such as livestock, seed, machinery, etc.) and marketing animal and plant products for agricultural production operations.
   f. Financial and legal management - Knowledge of the financial and legal aspects of managing an agricultural production business, such as agricultural loans and credit.
   g. Agribusiness organizations - Knowledge of current programs of agribusiness organizations, including their development, purposes, and usefulness.
   h. Government programs - Knowledge of current government policies, regulations, and programs available to and having influence upon agricultural production management and prices and income of rural people.
   i. Other agricultural business management - Competencies, not elsewhere included, in the business management of agricultural production operations.

B. AGRICULTURAL SUPPLIES/SERVICES - Knowledge of and skills in the production, processing, distribution, and use of consumable supplies used in the production of animals, plants, and their products; and the provision of services associated with the distribution of such supplies. Examples are agricultural chemicals, feeds, seeds, and fertilizers (plant food).

C. AGRICULTURAL MECHANICS - Knowledge of the power, machinery, tools, equipment structures, and conveniences utilized in the production of animals, plants, and their products; and skills in soil and water management for agricultural production.

1. Agricultural power and machinery - Knowledge of and skills in the selection, operation, servicing, maintenance, repair and safety of agricultural power -- engines, electricity, and hydraulics; and the planning, installation, servicing, assembling, adjusting, operating, repairing, and distribution of agricultural machinery.

2. Agricultural structures and conveniences - Knowledge of and skills in the planning, selection of materials for, and construction and maintenance of agricultural structures and conveniences.

3. Soil management - Knowledge of and skills in surveying and classifying soils; determining cropping systems and fertilizer; and conditioning and cultural practices for increasing agricultural production efficiency.

4. Water management - Knowledge of and skills in surveying, planning, laying out, constructing, using, and maintaining irrigation, drainage, water conservation, runoff, and erosion control systems; and maintaining proper soil-water-plant relationships.

5. Agricultural tools and equipment - Knowledge of and skills in the planning, fabrication, selection, use, maintenance, and distribution of agricultural hand and power tools and equipment, and the planning and establishing of home farm shops.

6. Agricultural electrification - Skills in making effective use of electricity and electrical equipment in agricultural production operations.

7. Other agricultural mechanics - Competencies, not elsewhere included, in the mechanical aspects of agricultural production.

D. AGRICULTURAL PRODUCTS - Skills in the inspection, sorting, grading, and storing of, and knowledge of the use, nutritive value, and other qualities of agricultural products (in their original state of production) and primary byproducts (in the first processed stage), including the processing of agricultural products. Also, skills in the marketing of agricultural products competencies, for operations other than agricultural production (compare II.A.4.e. purchasing and marketing). Included are food products such as meat, mild, cheese, fruit, grain, and oilseeds; and nonfood products such as cotton, tobacco, wool, furs, and wood.

1. Food products and primary byproducts - Knowledge of and skills in the preparation and processing of food products and primary byproducts for sale and consumption, and knowledge of the nutritive value of such products.
   a. Food products - Knowledge of the information, processes and science and decision-making skills associated with meats, fish, poultry, eggs milk, fruits, vegetables, cereal grains, oilseeds, mushrooms,

nuts, sugar, sap, and other food products.

b. Primary food byproducts - Knowledge of the information, processes, and science and decision-making skills associated with the primary byproducts of the food products listed above, such as cream, ice cream, butter, cheese, flour, cottonseed oil, alcohol, and syrup.

2. Nonfood products and primary byproducts - Knowledge of and skills in the processing, inspection, grading, sorting, and storing of nonfood products and primary byproducts for domestic and industrial uses.

a. Nonfood products - Knowledge of and skills in processing, marketing, and other activities involving nonfood products, such as ginning and baling cotton, grading and storing tobacco, sorting and grading wool, and other nonfood products such as furs, hemp, gum, and wood.

b. Primary nonfood byproducts - Knowledge of and skills in processing, marketing, and other activities involving primary nonfood byproducts, such as cotton yarn, wool yarn, processed tobacco, and wood pulp.

3. Other agricultural products - Competencies, not elsewhere included, associated with agricultural products and primary byproducts.

E. ORNAMENTAL HORTICULTURE - Knowledge of and skills in the culture of plants used principally for ornamental and esthetic purposes, including establishing, maintaining, and managing ornamental horticulture enterprises.

1. Arboriculture - Knowledge of and skills in the culture and maintenance of woody plants used for decoration and shade purposes.

2. Floriculture - Knowledge of and skills in field or greenhouse production of flowers and the arrangement of such flowers for ornamental purposes.

3. Greenhouse operation and management - Skills in and knowledge of producing plants under glass and in other artificial environments.

4. Landscaping - Knowledge of and skills in locating, planting, and maintaining turf, plants, shrubs, trees, or devices for the beautification of home grounds and other areas of human habitation and recreation.

5. Nursery operation and management - Knowledge of and skills in the production of turf, plants, shrubs, and trees for purposes of transplanting or propagating them.

6. Turf management - Knowledge of and skills in establishing, managing, and maintaining grassed areas for ornamental and recreational purposes.

7. Other ornamental horticulture - Competencies, not elsewhere included, associated with ornamental horticulture production, processing, marketing, and services.

F. RENEWABLE NATURAL RESOURCES - Skills in and knowledge of the conservation propagation, improvement, and utilization of renewable natural resources such as air, forests, soil, water, fish, plants, and wildlife, for economic and recreational purposes.

1. Forests - Skills in and knowledge of the conservation, propagation, improvement, and utilization of forests for economic and recreational purposes (see also II.G. forestry).

2. Recreational use of natural resources - Skills in and knowledge of the multiple uses of land, water, and other natural resources for recreational activities such as fishing, picnicking, hunting, camping, and nature study.

3. Soil - Skills in and knowledge of maintaining soil stability and productivity including the prevention of erosion, pollution, water logging, exhaustion of plant nutrients,and the accumulation of toxic salts.

4. Wildlife - Skills in and knowledge of the propagation, preservation, and improvement of wildlife, such as used in the operation of game farms and commercial hunting enterprises and the management of hunting areas (see also II. A.1.a.2). Other animals.

5. Water - Skills in and knowledge of water conservation practices such as the prevention of soil erosion and water pollution; flood control; aquatic weed control; and the development, conservation, and management of water supplies for agricultural, domestic, industrial, and recreational purposes.

6. Air - Knowledge of and skills in the control of air pollution, including the effects of agricultural activities on pollution, and the effects of pollution on plants and animals.

7. Fish - Skills in and knowledge of the propagation, rearing, stocking, and management of fish in public and private waters, such as used in fish farming and hatchery operations and commercial fishing enterprises (see also II.A.1.a.1) Animals produced for food and fiber.

8. Range - Skills in and knowledge of the preservation and improvement of natural range lands.

9. Other renewable natural resources - Competencies, not included elsewhere, associated with the conservation, propagation, improvement, and utilization of renewable natural resources.

G. FORESTRY - Skills in and knowledge of the multiple uses of forest lands and resources, including their protection and management for economic and recreational purposes and related services.

1. Forestry production and propagation - Skills and competencies in the propagation of forest trees, including Christmas trees, and the production of forest products, including initial collective activities such as harvesting trees and transporting logs (see also II.A.2.a.2) Other plants.

2. Forest protection - Knowledge of the behavior of and skills in the control of elements harmful to forests and forest resources (see also II.F.1. forests).

3. Forest products - Skills in and knowledge of the processing, selection, grading, and marketing of wood, gum, sap, nuts, and other forest raw materials (see also II.D. agricultural products).

4. Primary forest byproducts - Skills in and knowledge of the processing, marketing, and other funcitons associated with maple syrup, wood pulp, and other forest byproducts in the first processed stage (see also II.D. agricultural products).

5. Recreational use of forest lands - (see II.F.2 recreational use of natural resources).

6. Other forestry - Competencies, not included elsewhere, associated with the multiple uses of forest lands and resources.

H. OTHER AGRIBUSINESS - Competencies, not included elsewhere, associated with agricultural production, supplies/services, mechanics, and products; ornamental horticulture; renewable natural resources; and forestry.

OCCUPATIONAL ADVISORY COMMITTEE MEMBERS FOR THE PROJECT

CAREER EDUCATION IN AGRIBUSINESS, NATURAL RESOURCES AND ENVIRONMENTAL IMPROVEMENT

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Taxonomy Areas	Advisor	Title and Address
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AGRICULTURAL PRODUCTION
Livestock Farming
(Cattle, Sheep, Hogs, Goats)

Categories:
A. Livestock Farming
B. Poultry Farming
C. Plant Farming
D. Horse Production

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Stock ranch foreman (cattle, sheep, swine)	413.131	x	x				x
Cattle producer	413.181	x		x			x
Sheep rancher	413.131	x	x	x			x
Farm or ranch hand	419.884	x	x				x
Ranch or farm manager	413.181	x	x	x	x	x	
Wool buyer (broker - buyer)	162.158	x	x	x		x	
Animal nutritionist (animal husbandry)	040.081				x		x
Veterinarian	073.108				x		x
USDA inspector	143.684				x		x
Part-time farmer	421.883		x				x
Swine farmer	413.181	x	x				x
Artificial inseminator	467.384	x	x				x
Breed association fieldman	108.118		x		x		x
Livestock marketing specialist (ag. economist)	050.088				x		x
Livestock buyer	162.158			x			x
Agricultural farm advisor or consultant	096.128			x	x		x
Animal groomer (stableman - groom)	356.874	x	x				x
Livestock geneticist (heredity)	041.081				x		x
Livestock serviceman	466.887	x	x				x
Veterinarian's assistant	073.381	x		x			x
Livestock sales organization manager	261.258	x	x				x
Foreign agricultural service	188.118	x	x	x	x		x

AGRICULTURAL PRODUCTION Plant Farming		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
Farm manager	409.168	x	x				x
Farm foreman	401.138	x	x				x
Tenant farmer	409.181	x	x				x
Farm laborer	401.887	x	x				x
Custom farm equipment operator	409.883	x	x				x
Sharecropper	409.884	x	x				x
Grain and/or forage farmer	401.181	x	x				x
Head irrigator	422.137	x					x
Plant pathologist	041.081	x			x		x
Broker and market reporter	162.158	x		x			x
Farm advisor or consultant	096.128	x			x		x
Farm appraiser	191.287	x	x		x		x
Farm organization fieldman	191.368	x	x	x			x
Plant breeder, geneticist	041.081				x		x
Range technician or specialist	040.081	x			x		x
Soils scientist	040.081	x			x		x
Soil conservationist	040.081	x			x		x
Soil tester	029.281				x		x
Entomologist	041.081				x		x

AGRICULTURAL PRODUCTION Horse Production		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
Horse farm manager	419.131	x	x				x
Horse trainer	419.884	x	x				x
Horse rancher	413.181		x				x
Farrier	356.381	x	x	x			x
Horse buyer or agent	162.158	x	x		x		x
Horse farm foreman	413.131	x	x				x
Horse extension specialist	096.168	x			x		x
Veterinarian	073.108	x			x		x
Horseman, show	413.181	x	x				x

AGRICULTURAL PRODUCTION
Poultry Farming

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Poultry farm manager	412.137	x	x				x
Poultry farm foreman	412.137	x	x				x
Poultry breeder, geneticist	041.181	x			x		x
Poultry farm hand	412.884	x	x				x
Poultry salesman	261.258	x	x	x			x
Hatchery manager	412.168	x	x	x			x
Egg-processing plant manager	412.137	x	x	x			x
Incubator operator	412.137	x		x			x
Poultry association fieldman	108.118	x	x		x		x
USDA inspector	413.684	x	x	x	x		x

AGRICULTURAL SUPPLIES & SERVICES
Chemicals

Categories:
A. Chemicals
B. Feed
C. Seed
D. Fertilizer and Lime

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Scout (Agri.)	465.381		x				x
Ag. chemical equipment operator	409.883			x			x
Aerial spray operator	196.283	x		x			x
Chemical firm formulation aide				x			x
Chemical firm plant foreman				x			x
Ag. chemical salesman	277.358			x			x
Ag. chemical product serviceman (fieldman)	180.118			x			x
Ag. chemical sales manager	163.118			x			x
Ag. chemical public relationsman	165.068		x				x
Ag. chemical firm manager	163.118				x		x
Ag. chemical store manager (branch)	183.118			x			x
Ag. chemicals inspector	168.287			x			x
Weed abatement foreman	096.168			x			x
Ag. extension specialist	096.128				x		x
Plant pathologist	070.081				x		x
Ag. chemist	022.081				x		x
Research assistant	199.384		x				x
Ag. biological technician	013.181			x			x
Agri-marketing specialist	050.088				x		x

AGRICULTURAL SUPPLIES & SERVICES
Fertilizer and Lime

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Mixer and blender operator	520.885			x			x
Mixer and blender foreman	520.885			x			x
Formulation specialist	559.782			x			x
Fertilizer salesman (whole. tr.)	277.358				x		x
Fertilizer company representative (fieldman)	180.168			x			x
Fertilizer company public relations man	165.068			x			x
Fertilizer company sales manager (any ind.)	163.118				x		x
Fertilizer company credit manager	168.168				x		x
Fertilizer plant manager	183.118				x		x
Fertilizer store manager (branch manager)	183.118				x		x
Anhydrous ammonia inspector				x			x
Feed and fertilizer inspector (gov. ser.)	096.168			x			x
Agronomist	040.081				x		x
Agricultural chemist	022.081				x		x
Research technician (lab technician)	199.384			x			x
Agri-marketing specialist	050.088				x		x

AGRICULTURAL SUPPLIES & SERVICES
Feed

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Feed grinder	521.885	x	x			x	
Feed mixer (batch mixer)	520.885		x				x
Feed mixer or grinder helper	520.886		x				x
Feed mill superintendent	529.138			x			x
Feed mill foreman	529.132		x	x			x
Feed salesman	277.358			x			x
Feed sales manager	163.118				x		x
Feed company credit manager (contract manager)	168.168				x		x
Feed company farm advisor (fieldman)	096.128			x			x
Feed company public relations man	165.068	x		x			x
Feed company purchasing agent	162.158				x		x
Feed company manager (grain & feed mill; whole tr)	162.168				x		x
Feed store manager (branch)	183.118				x		x
Animal nutritionist (prof. & kin.)	040.081				x		x
Agri-marketing specialist (prof. & kin.)	050.088			x	x		x
Research technician (prof. & kin.)	199.384			x	x		x
Feed research aide (grain & feed mill)	049.384			x			x
Grain mill products inspector (grain & feed mill)	529.387			x			x

AGRICULTURAL SUPPLIES & SERVICES
Seed

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Seed cleaner operator (agri.)	551.885		x				x
Seed grader (grader man, agri.)	521.885			x			x
Seed mill foreman (grain & feed mill)	529.132			x			x
Seed mill superintendent (grain & feed mill)	529.138			x			x
Seed mill helper (grain & feed mill)	520.886		x				x
Seed salesman (whole tr.)	277.358			x			x
Seed broker (ret. tr.; whole. tr.)	162.158			x			x
Seed company sales manager (any ind.)	163.118				x		x
Seed company credit manager (contract manager)	168.168				x		x
Seed company fieldman (sales representative)	165.068			x			x
Seed company manager	183.118				x		x
Seed store manager (branch manager)	183.118				x		x
Agronomist	040.081				x		x
Seed inspector (gov. ser.)	096.168			x			x
Geneticist - botanist	041.081				x		x
Seed analyst - farm seed specialist	040.381				x		x
Research technician (prof. & kin.)	199.384			x			x
Agri-marketing specialist (prof. & kin.)	050.088				x		x

AGRICULTURAL EQUIPMENT & MECHANICS

Power & Equipment

Categories:
A. Power and Equipment
B. Agricultural Structures
C. Soil and Water
D. Agricultural Electrification

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Ag. equipment dealer (manager)	183.118			x			x
Ag. equipment branch manager	183.118				x		x
Ag. equipment management consultant	184.118				x		x
Ag. equipment sales manager (mfg. branch)	185.168				x		x
Ag. equipment sales representative (mfg. branch)	165.068			x			x
Ag. equipment salesman	277.358			x			x
Ag. equipment sales manager (dealer level)	277.358			x			x
Ag. equipment territory manager	183.118			x			x
Ag. equipment parts manager	185.168			x			x
Ag. equipment parts man	285.358		x				x
Ag. engineer	013.081				x		x
Ag. equipment service manager	187.168			x			x
Ag. equipment service representative	638.281			x			x
Ag. equipment mechanic	624.281			x			x
Ag. equipment mechanics helper	624.381		x				x
Ag. equipment set-up man	624.381		x				x
Ag. equipment field and maintenance mechanic	624.381		x	x			x
Inspector and tester (ag. equipment)	624.381			x			x
Ag. equipment systems specialist (hydraulic spec.)	621.281			x			x

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AGRICULTURAL EQUIPMENT & MECHANICS
Agricultural Structures

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Farm building specialist - farmstead planner	096.128	x		x			x
Designing engineer	007.181				x		x
Rural carpenter	860.781	x	x	x			x
Farm appraiser	160.288	x		x			x
Rural carpenters helper	860.781		x				x
Farm building components salesman	276.358			x	x		x
Agricultural building ventilation-insulation technician				x			

AGRICULTURAL EQUIPMENT & MECHANICS
Soil & Water

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Irrigation equipment operator			x			x	
Sprinkling)	422.884 and						
Standpipe)	422.887						
Valvepipe)							
Irrigation engineer	005.081				x		x
Soil scientist	040.081				x		x
Soil fertility expert	040.081				x		x
Irrigation district manager	184.118		x				x
Soil biologist	041.081				x		x
Soil surveyor	040.081				x		x
Soil testing technician (lab tester)	029.181			x			x
ASCS field reporter	249.368	x		x			x
Soil conservationist	040.081				x		x
Geologist	024.081				x		x
Biochemist	040.081				x		x
Heavy equipment operator	424.883	x	x				x
ASCS compliance supervisor	168.168				x		x
Map clerk	249.558			x			x
Soil bacteriologist	041.081				x		x
Survey instrument man (surveyor assistant)	018.687		x	x			x
Soil conservation aide	040.081		x	x			x
Ag. engineer	013.081				x		x
Soil service manager (district supervisor)	040.081	x	x				x
Ag. engineer technician	013.181			x			x

AGRICULTURAL EQUIPMENT & MECHANICS
Agricultural Electrification

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Rural electrician	824.281	x		x			x
Rural electricians helper	824.281	x	x				x
Electrical safety technician (inspector)	168.284	x		x			x
Materials handling equipment salesman					x		x
Salesman, rural power (public utilities)	257.358			x			x
Rural service engineer	003.187				x		x

AGRICULTURAL PRODUCTS
(FOOD PROCESSING)
Dairy Processing

Categories
A. Dairy Processing
B. Meat Processing
C. Fruits, Vegetables & Nuts
D. Egg Processing
E. Other Food Products
F. Generally related

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Milk sampler	379.887	x	x				x
Miller foreman	521.130	x	x				x
Clarifier	521.885	x	x				x
Batch freezer	523.885	x	x				x
Dairy-processing-equipment operator	529.782	x	x				x
Dairy-plant engineer	007.081	x			x		x
Dairy technologist	040.081	x			x		x
Dairy tester	469.381	x		x			x

AGRICULTURAL PRODUCTS
(FOOD PROCESSING)
Meat Processing

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Offal man	521.884	x	x				x
Foreman, cured-meat packing	525.130	x	x				x
Meat specialist	316.884	x			x		x
Butcher	525.381	x	x				x

AGRICULTURAL PRODUCTS (FOOD PROCESSING) Fruits, Vegetables & Nuts Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Washer, food products	529.887	x	x				x
Blancher operator	521.885	x	x				x
Clarifier	521.885	x	x				x
Redrying machine operator	523.132	x	x				x
Batch freezer	523.885	x	x				x
Fruit-packaging-grader operator	920.885	x	x				x
Sorter, agricultural products	529.687	x	x				x

AGRICULTURAL PRODUCTS
(FOOD PROCESSING)
Egg Processing

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Egg-washing-machine operator	412.886	x	x				x
Clarifier	521,885	x	x				x
Batch freezer	523.885	x	x				x
Egg breaker	521.887	x	x				x
Egg candler	529.687	x	x				x
Egg processor	559.887	x	x				x
Egg-room foreman	412.137	x	x				x
Egg stripper	436.884	x	x				x

AGRICULTURAL PRODUCTS (FOOD PROCESSING) Other Food Products Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Washer, food products	529,887	x	x				x
Rice miller	521,138	x	x				x
Clarifier	521,885	x	x				x
Redrying machine operator	523,132	x	x				x
Drier	529,885	x	x				x

AGRICULTURAL PRODUCTS (FOOD PROCESSING) Generally related Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Blending-plant operator	520.782	x	x				x
Batter mixer	520.885	x	x				x
Battery operator	521.782	x	x				x
USDA inspector	168.287	x			x		x
Machine operator	521.885	x	x				x
Laboratory tester	029.381	x		x			x
Plant processing supervisor	183.168	x	x				x
Warehouse supervisor	223.138	x	x				x
Quality control technician	529.387	x		x			x
Field-contact man	162.158	x		x			x
Tester, food products	199.281	x		x			x
Quality control superintendent	022.168	x			x		x
Grader-packer	525.387	x			x		x
Superintendent of storage	184.168	x			x		x
Receiving and shipping employee	223.138	x	x				x
Bacteriological technician	029.281	x		x			x
Assistant food plant sanitarian	529.138	x		x			x
Processing plant foreman	920.137	x	x				x
Plant superintendent	180.168	x			x		x
Line supervisor	920.380	x	x				x

ORNAMENTAL HORTICULTURE Arboriculture Occupation	B. Floriculture C. Landscaping D. Nursery Occupation and Management E. Turf Grass Management F. General		Level of Education Required				Level of Guide Needed	
			On Job	High School	Technical	College	Local	National
Teacher		097.228				x		x
Arborist		040.181	x	x	x			x
Arboriculturist		040.181			x	x		x
Tree expert		409.181	x	x				x
Tree surgeon		409.181		x	x			x
Arboretum foreman		407.138	x	x				x
Park foreman		407.134	x	x				x
Arboretum worker		404.884	x					x
TASKS THAT MAY BE SPECIFIC JOBS IN SOME SITUATIONS:								
Tree pruner								
Tree girdler								
Tree budder								
Tree planter								
Tree service proprietor								
Tree sprayer								
Tree remover								

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ORNAMENTAL HORTICULTURE
Floriculture

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Teacher	097.228			x	x		x
Florist (wholesale)	260.458	x	x	x			x
Retail florist	260.458		x	x			x
Production manager	181.118	x		x			x
Flower shop manager	185.168		x				x
Floral designer	142.081	x	x				x
Pest control specialist	468.381	x		x			x
Retail flower salesman	260.458	x	x				x
Flower grower	406.181	x	x				x
Greenhouse employee	406.887	x	x				x
(Includes following tasks that may be specific occupations in certain situations:)							
Potter							
Planter							
Dipper							
Clipper							

ORNAMENTAL HORTICULTURE
Landscaping

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Landscape draftsman	019.188			x			x
Teacher	097.228				x		x
Landscape architect	019.081				x		x
Landscape maintenance superintendent	407.138			x			x
Landscape contractor	407.181			x			x
Cemetery superintendent	407.887			x			x
Landscape nurseryman	406.168			x			x
Park or parkway superintendent	407.868			x			x
Pest control specialist	465.381	x		x			x
Landscape maintenance foreman	407.181	x	x				x
Landscape installation foreman	407.181	x	x				x
Parkway maintenance foreman	407.134	x					x
Landscape salesman	261.158			x			x
Landscape gardener	407.181	x	x	x			x
Landscape laborer	407.887	x	x				x
Park laborer	407.887	x	x				x

ORNAMENTAL HORTICULTURE
Nursery Occupation and Management

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Teacher	097.228				x		x
General manager	406.168			x			x
Nursery production manager	180.168		x	x			x
Assistant manager --- retail sales	185.168	x	x				x
Pest control specialist	465.381	x		x			x
Nursery foreman	407.138	x	x				x
Nursery salesman	277.358	x	x				x
Nursery shipping clerk	261.158	x	x				x
Nurseryman	406.168			x			x
Nursery order-filler	406.884	x					x
Nursery sales agent	298.158	x					x
Nursery stock jobber	406.168	x					x
Nursery worker	406.887	x					x
(Includes following tasks that may be specific occupations in certain situations:)							
Planter							
Digger							
Baller							

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ORNAMENTAL HORTICULTURE
Turf Grass Management

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Teacher	097.228				x		x
Golf course superintendent	407.138			x			x
Turf production manager	180.168		x	x			x
Grounds superintendent	407.138	x		x			x
Pest control specialist	465.381	x		x			x
Turf research and development technician	040.081			x			x
Golf course installation foreman	407.883			x			x
Turf grass maintenance foreman	899.133	x	x				x
Park, parkway or golf course foreman	407.134	x	x				x
Sod salesman	277.358	x	x				x
Equipment maintenance repairman	624.381	x	x				x
Grounds maintenance employee	407.884	x					x

ORNAMENTAL HORTICULTURE General		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
Vocational horticulture teacher	097.228				x		x
Entomologist	041.081			x	x		x
Plant pathologist	041.081			x	x		x
Soil scientist	040.081			x	x		x
General manager (nursery)	406.168			x			x
Assistant manager	180.168			x			x
Assistant manager (retail sales)	180.168		x	x			x
Production manager (superintendent of production)	180.168		x	x			x
Office manager	185.168		x				x
Advertising coordinator	258.358				x		x
Adult education specialist	099.118				x		x

AGRICULTURAL RESOURCES Forestry Occupation	Categories A. Forestry B. Recreation C. Soil D. Wildlife E. Water F. Fish G. Range H. Plants I. Other		Level of Education Required				Level of Guide Needed	
			On Job	High School	Technical	College	Local	National
Sawmill manager		669.138	x	x				x
Timber stand improvement foreman		940.137	x	x				x
Millyard foreman		669.137	x	x				x
Assistant logging superintendent		949.137	x	x				x
Forestry survey aide		441.384	x		x			x
Forestry research assistant		441.	x			x		x
Lumber inspector and/or grader		669.587	x	x				x
Tree nursery management assistant		180.168	x	x	x			x
Log and pulp scaler		941.487	x	x				x
Timber cruiser		449.287	x	x				x
Forest fire control technician		441.887	x	x				x
Kiln operator and schedule man		563,381	x	x				x
Checker-scaler		940.137	x	x				x
Buyer for sawmill		162.158	x	x				x
Pulp buyer		162,158	x	x				x
Forest recreation technician		040.081	x	x				x
Park naturalist (all areas)		099.228	x			x		x
Land manager (all areas)		189.118	x	x				x
Foreman --- parks, wildlife, etc.		407.134	x	x				x
Conservation aide technician (all areas)		040.081	x		x			x
Research technician --- parks, wildlife, etc.		040.081	x		x			x
Soil conservation technician		040.081	x		x	x		x
Forest ecologist		040.081	x			x		x
Forest genealogist		052.088	x			x		x
Forest inspector		442.687	x		x			x
Fire lookout		441.168	x	x				x
Fire warden		441.168	x		x			x
Fire patrolman		441.687	x		x			x
Fire tower operator		441.168	x		x			x
Forest fire fighter		441.887	x	x				x
Sprayer		441.887	x	x				x

AGRICULTURAL RESOURCES
Recreation

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Park superintendent	188.168	x			x		x
Golf course manager	180.168	x		x			x
Park ranger	169.168	x	x				x
Parkway foreman	407.134	x	x				x
Superintendent --- parks, recreation, park system	407.138	x			x		x
State or national park employee	441.168	x		x			x
Park attendant	407.887	x	x				x
Ground maintenance technician	899.133	x		x			x
Park landscape technician	407.181	x		x			x
Roadside development engineer	019.081	x			x		x
Roadside development technician	019.081	x			x		x
Park naturalist	099.228	x			x		x
Animal keeper	451.181	x	x				x
Campground caretaker	407.887	x	x				x
Huntsman/animal keeper/hunting and fishing guide	452.868	x	x				x
Forest recreation technician	040.081	x	x				x
Research technician --- parks, wildlife, etc.	040.081	x		x			x

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AGRICULTURAL RESOURCES
Soil

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Soil scientist	040.181	x			x	x	x
Recreation farm manager	187.168	x	x				x
Horticulturist	040.081	x			x		x
Agronomist	040.181	x			x		x
Landscape supervisor	407.181	x		x			x
Garden center technician	260.458	x	x	x			x
Soil conservation aide	040.081	x	x				x
Gardener or caretaker	407.884	x					x
Assistant greenskeeper	407.138	x	x				x
Grounds superintendent	407.138	x		x			x
Soil conservationist	040.081	x			x		x
Soil conservation agricultural engineer	040.081	x			x		x
Soil conservation civil engineer	040.081	x			x		x
Soil conservation administrative employee	040.081	x			x		x
Soil conservation engineering technician	040.081				x		x
Soil conservation technician	040.081	x		x	x		x
Park landscape technician	407.181	x		x			x

AGRICULTURAL RESOURCES
Wildlife

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Gamebird breeder	419.181	x	x				x
Game farm worker	419.884	x					x
Government trapper or hunter	379.168	x	x				x
Wildlife aide	419.884	x	x				x
Wildlife and conservation research aide	379.168	x	x				x
Natural history curator	102.118	x			x		x
Wildlife biologist	041.081	x			x	x	x
Fish biologist	041.168	x			x	x	x
Fish management specialist	041.168	x		x		x	x
Aviary manager	409.168	x			x	x	x
Game (warden) protector	379.168	x		x			x
Biologist aide	049.384	x		x			x
Experimental biology technician	041.081	x		x			x
Wildlife technician	019.281	x		x			x
Taxidermist	199.281	x	x				x
Game management employee	451.181	x					x
Refuge manager	187.168	x		x			x
Zoologist	041.081	x			x		x
Predatory-animal hunter	451.781	x	x				x
Trapper	451.781	x	x				x
Game farmer	419.181	x	x				x
Gamekeeper	451.181	x	x				x
Manager, quail farm	189.118	x	x				x
Game farm helper	419.884	x	x				x
Quail farm worker	419.884	x	x				x
Research technician --- parks, wildlife, etc.	040.081	x		x			x

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AGRICULTURAL RESOURCES Water		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
Water management researcher	976.131	x			x		x
Waste disposal inspector	955.883	x	x	x	x		x
Aquaculture technician	041.168	x		x			x
Marine quality control technician	041.081	x		x			x
Estuarine research assistant	041.168	x		x			x
Marine pollution research assistant	041.168	x		x			x
Agronomist	040.181	x			x		x
Soil conservation aide	040.081	x	x				x

AGRICULTURAL RESOURCES Fish Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Fish hatchery manager (or superintendent)	436.884	x		x		x	x
Fishery foreman	189.118	x	x				x
Fish processing technician	180.168	x		x			x
Fish detection technician	022.168	x		x			x
Food fisheries technician	041.168	x		x			x
Fish hatchery worker	436.884	x	x				x
Fish farm helper	436.181	x	x				x
Seine man	431.884	x	x				x
Biologist	041.081				x		x
Laboratory technician --- ocean fishing	022.168	x		x			x
Fish warden superintendent	379.168	x			x		x
Fish warden	379.168	x		x			x
Fish culturist	041.168	x		x			x
Fish farmer	436.181	x	x	x			x
Fishing instructor	439.228	x		x			x
Lake manager	189.118	x	x				x
Live bait dealer	162.158	x	x				x
Aquaculture technician	041.168	x		x			x
Marine quality control technician	041.081	x		x			x
Estuarine research assistant	041.168	x		x			x
Marine pollution research assistant	041.168	x		x			x
Natural history curator	102.118	x			x		x
Wildlife biologist	041.081	x			x		x
Fish biologist	041.168	x			x		x
Fish management specialist	041.168	x		x		x	x
Game (warden) protector	379.168	x		x			x
Biologist aide	049.384	x		x			x
Experimental biology technician	041.081	x		x			x
Wildlife technician	019.281	x		x			x
Taxidermist	199.281	x	x				x
Refuge manager	187.168	x		x			x

AGRICULTURAL RESOURCES
Range

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Turf grass technician	407.181	x	x	x			x
Range manager	040.081	x		x			x
Range technician	040.081	x		x			x
Range conservationist	040.081	x			x	x	

AGRICULTURAL RESOURCES Plants		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
Botanist	041.081	x			x		x
Weed-control supervisor	096.168	x		x			x
Blight-control foreman	465.137	x	x				x
Plant pest control worker	465.381	x	x				x
Weed inspector	465.781	x			x		x
Range technician	040.081	x		x			x
Range conservationist	040.081	x			x	x	
Biologist	041.081				x		x
Laboratory technician --- ocean fishing	022.168	x		x			x
Aquaculture technician	041.168	x		x			x
Marine quality control technician	041.081	x		x			x
Estuarine research assistant	041.168	x		x			x
Marine pollution research assistant	041.168	x		x			x
Natural history curator	102.118	x			x		x
Wildlife biologist	041.081	x			x	x	x
Fish biologist	041.168	x			x	x	x
Fish management specialist	041.168	x		x		x	x
Aviary manager	409.168	x			x	x	x
Biologist aide	049.384	x		x			x
Experimental biology technician	041.081	x		x			x
Wildlife technician	019.281	x		x			x
Game management employee	451.181	x					x
Refuge manager	187.168	x		x			x
Horticulturist	040.081	x			x		x
Agronomist	040.181	x			x		x
Landscape supervisor	407.181	x		x			x
Garden center technician	260.458	x	x	x			x
Soil conservation aide	040.081	x	x				x
Gardener or caretaker	407.884	x					x
Assistant greenskeeper	407.138	x	x				x
Grounds superintendent	407.138	x		x			x

AGRICULTURAL RESOURCES Plants (con'd.) Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Park landscape technician	407.181	x		x			x
Soil conservation technician	040.081	x		x	x		x

AGRICULTURAL RESOURCES
Other

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Cartographic survey technician aide	018.281	x	x				x
Cartographic technician	018.281	x		x			x
Geodetic technician	024.081	x		x			x
Meteorological technician	025.088	x		x			x
Surveying technician	018.181	x		x			x
Chief land examiner	449.287	x			x		x
County-agricultural agent	096.128	x			x		x
Conservation engineer	040.081	x			x		x
Foreman, blight and pest control	465.137	x		x			x
Pest control worker	465.381	x	x				x
Vocational training instructor	099.118	x			x		x
Waste disposal inspector	955.883	x	x	x	x		x

FORESTRY
Forestry --- Production

Categories:
A. Forestry --- Production
B. Forestry --- Protection
C. Forestry Products
D. Forestry By-Products
E. Forestry --- Recreational Use

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Logger	449.287	x	x				x
District forest superintendent	442.168	x		x			x
Transportation supervisor	184.168	x	x				x
Timber stand improvement foreman	940.137	x	x				x
Woods foreman	040.081	x	x				x
Logging foreman	949.137	x	x				x
Logging operations inspector	609.684	x	x				x
Surveyor	441.384	x	x				x
Radio technician	003.187	x	x				x
Farm planner	040.081	x	x				x
Log contractor	469.168	x	x				x
Pulp buyer	162.158	x	x				x
Heavy equipment operator	424.883	x	x				x
Log scaler	941.487	x	x				x
Supervisor	669.137	x	x				x
Timber market estimator	191.288	x	x				x
Limber	940.884	x	x				x
Loader operator	922.883	x	x				x
Gang sawyer	424.887	x	x				x
Chipper operator	442.887	x	x				x
Ranger weigher	224.487	x	x	x			x
Crawler driver	850.883	x	x				x
Skidway man	979.281	x	x				x
Resaw operator	429.887	x	x				x
Crane operator	921.280	x	x				x
Tractor driver and loader	409.883	x	x				x

FORESTRY
Forestry --- Protection

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Timber stand improvement foreman	940.137	x	x				x
Range conservationist	040.081	x		x			x
Surveyor	441.384	x	x				x
Tropical research director	189.118	x			x		x
Forest fire control technician	441.137	x		x			x
Forest fireman	441.887	x	x				x
Fire guard	441.168	x	x				x
Treating technician	669.130	x		x			x
Tree surgeon	109.181	x		x			x
Tree service salesman	289.358	x	x				x
Conservation aide technician	040.081	x		x			x
Plant physiologist	041.081	x			x		x
Quality control superintendent	022.168	x			x		x
Tree service manager	183.118	x		x			x
Inspector	669.587	x			x		x
Entomologist	041.081				x		x
Biologist aide	041.081			x			x
Forest technician	005.187			x			x
Forest specialist	040.081	x			x		x
Forest ranger	040.081	x			x		x
Forest aide	441.384	x		x			x

FORESTRY Forestry Products Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Pulp buyer	162.158	x	x				x
Heavy equipment operator	424.883	x	x				x
Conservation aide technician	040.081	x		x			x
Superintendent	187.168	x			x		x
Warehouse superintendent	184.168	x			x		x
Wood procurement superintendent	180.168	x			x		x
Mill superintendent	669.137	x			x		x
General warehouse supervisor	223.138	x	x				x
Supervisor	669.137	x	x				x
Wood marketing foreman	186.168	x	x				x
Plant foreman	183.118	x	x				x
Warehouse foreman	929.139	x	x				x
Dry kiln foreman	563.381	x	x				x
Plant manager	180.168	x		x			x
Process inspector	619.130	x		x			x
Plant engineer	007.187	x			x		x
Quality control	012.168	x			x		x
Broker	162.158	x		x			x
Saw mill equipment operator	409.883	x	x				x
Kiln operator	563.381	x	x				x
Machine man	539.130	x	x				x
Veneer operator	663.885	x	x				x
Crane operator	921.280	x	x				x
Tractor driver and loader	409.883	x	x				x
Grader	669.587	x	x				x
Debarker operator	922.887	x	x				x
Mill employee	667.782	x	x				x

FORESTRY Forestry By-Products		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
Gum gatherer	442.887	x	x				x

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FORESTRY Forestry --- Recreational Use		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
Range conservationist	040.081	x		x			x
Wildlife technician	040.081	x		x			x
Game farm worker	451.181	x	x				x
Enforcement agent	379.168	x	x				x
Wildlife biologist	041.081	x			x		x
Forest recreation technician	040.081	x		x			x
Park naturalist	099.228	x			x		x
Park superintendent	188.168	x			x		x
Park ranger	169.168	x			x		x
Park supervisor	407.134	x	x				x
Park landscape technician	407.181	x		x			x
Park worker	407.887	x	x				x
Recreation farm manager	195.228	x	x				x
Recreation area supervisor	407.138	x	x				x
Superintendent	187.168	x			x		x
Forest ranger	040.081	x			x		x

ENVIRONMENTAL PROTECTION
Water

Categories:
A. Water
B. Air, Radiation, Noise
C. Waste Water
D. Solid Wastes
E. Generally Related

Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Estuarine oceanographer	024.081				x		x
Ground water hydrologist	024.081				x		x
Water systems foreman	862.138	x	x				x
Watershed manager	954.782			x			x
Aquatic biologist	041.081				x		x
Nuclear engineer	015.081				x		x
Oceanographer	024.081				x		x
Water treatment plant superintendent	005.168	x	x	x			x
Water treatment plant assistant superintendent	184.168	x	x	x			x
Water treatment plant maintenance mechanic	630.281	x					x
Water treatment plant maintenance helper	630.281	x					x
Water treatment plant chemist	022.281	x		x	x		x
Water treatment plant laboratory technician	022.281	x		x			x
Water treatment plant shift foreman	862.138	x	x				x
Water treatment plant operator	954.782	x	x				x
Water treatment plant operator aide	954.782	x					x

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ENVIRONMENTAL PROTECTION Air, Radiation, Noise		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
Radiological health specialist	199.485				x		x
Radiological health technician (monitor)	199.187	x	x	x			x
Radiological pollution control technician	012.168		x	x			x
Air pollution control director	012.168	x	x	x	x		x
Air pollution control supervisor	012.168	x	x	x	x		x
Air pollution control chemist	022.081			x	x		x
Air pollution control engineer	012.088			x	x		x
Air pollution control meteorologist	025.288				x		x
Air pollution control specialist	096.168				x		x
Air pollution control inspector	609,684	x	x				x
Air pollution control technician	029.281	x	x	x			x
Air pollution control aide	012.168	x	x				x
Noise pollution control technician	012,168		x	x			x
Incinerator foreman	955.130	x	x				x
Incinerator operator	955.782	x	x				x
Meteorologist	025.088				x		x
Meteorological aide	025.288	x	x	x			x
Combustion engineer	008.081				x		x
Air analyst (air tester)	012.281			x			x
Climatologist	025.088			x	x		x
Power plant operator	952.782	x	x	x			x
Power plant engineer	952.782				x		x
Nuclear engineer	015.081				x		x

ENVIRONMENTAL PROTECTION Waste Water		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
WASTE WATER TREATMENT PLANT:							
Superintendent	005.168	x	x	x			x
Assistant superintendent	184.168	x	x				x
Operations supervisor	954.782	x	x				x
Shift foreman	862.138	x	x				x
Maintenance supervisor	891.138	x	x				x
Mechanical maintenance foreman	638.131	x	x				x
Maintenance mechanic	630.281	x	x				x
Maintenance helper	899.281	x	x				x
Chemist	022.281				x		x
Laboratory technician	022.281			x			x
Waste water technician	012.168		x	x			x
Operator	955.782	x	x				x
Operator aide	955.885	x	x				x
Electrician		x	x	x			x

ENVIRONMENTAL PROTECTION Solid Wastes		Level of Education Required				Level of Guide Needed	
Occupation		On Job	High School	Technical	College	Local	National
Sanitary engineer	005.081			x	x		x
Sanitarian	168.287	x	x	x			x
Refuse collector	909.887	x					x
Solid waste disposal operator	955.780	x	x				x

ENVIRONMENTAL PROTECTION Generally Related Occupation		Level of Education Required				Level of Guide Needed	
		On Job	High School	Technical	College	Local	National
Health physicist	079.021				x		x
Limnologist	041.081				x		x
Industrial hygienist	168.168				x		x
Environmental inspector (air, water, land, waste)	003.281		x				x
Biological technician	049.384	x	x	x			x
Biochemist	041.081				x		x
Biophysicist	041.081				x		x
Microbiologist	041.081				x		x
Zoologist	041.081			x	x		x
Botanist	041.081			x	x		x
Analytical chemist	022.081			x	x		x
Inorganic chemist	022.281			x	x		x
Organic chemist	022.081			x	x		x
Life sciences teacher (biology, physiology)	091.228				x		x
Industrial engineer	012.188				x		x
Field health officer	168.168	x		x			x
Engineering aide	012.168			x			x
Civil engineer	005.081				x		x
Mechanical engineer	007.081				x		x
Laboratory technician (laboratory tester)	029.281			x			x

THE OHIO STATE UNIVERSITY

Dear Sir:

We are currently working on a project funded by the U. S. Office of Education to develop curriculum guides for career education in agribusiness, natural resources and environmental protection. One of the tasks is to determine how much and what type of material exists which is relevant to this project. One assumption we are beginning with is that a large portion of the curriculum materials generated by vocational educators has been fed into one of two systems: the ERIC system at the Center for Vocational and Technical Education or the Source Listing of the AVA, Agricultural Education Division Curriculum Materials Committee.

The ERIC personnel are cooperating with our project by providing us access to the documents (or microfische of the documents) which have been put into their system. This will allow us the opportunity to define, review and evaluate all materials in the ERIC system without having to obtain hard copies from the original producers.

This arrangement works fine for the review and evaluation but, in order to have our own copies of those documents identified as valuable in this project, we are going back to the producers of the materials.

We have already received many of the documents and appreciate this help very much. We are also quite fortunate in having many of these already available through the past fine cooperation of the various curriculum laboratories or teacher education institutions with the Ohio Agricultural Curriculum Materials Service. These copies are available to us and we are making use of them rather than asking for another copy.

We have located several documents which we believe may be valuable in the guides being developed but, as yet, we do not have a hard copy. If these apply to your area, we have listed them on an enclosed form and would

appreciate it if you could provide us with a copy of these titles. However, if there is a charge for these, please enclose a voucher so that we may properly reimburse the cost.

In several cases, we did not get all documents defined and consolidated into one request. If you have received another request in addition to this, we apologize and hope you'll understand we are working to keep multiple mailings to a minimum. If you have new materials or have knowledge of documents (other than ones requested) which you believe may be relevant to curriculum guides for career education in agribusiness, natural resources and environmental protection, we would appreciate you forwarding these.

Your help will aid the effort to provide meaningful curriculum guides for career education in the agribusiness and other areas.

Sincerely,

William S. Farrington

William S. Farrington, Assistant Director
Career Education in Agribusiness, Natural
Resources and Environmental Protection
250 Agricultural Administration Building

WSF/no

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KEY FOR REVIEWING AND INDEXING VOCATIONAL CURRICULUM GUIDE DOCUMENTS

Designation of the material:

1. Curriculum guide
2. Teacher's guide
3. Teacher's and student's guide (combination)
4. Student manual with teacher direction
5. Self-study guide for student
6. Knowledge approach (teaching strategy)
7. Occupation approach (teaching strategy)
8. Objectives stated in teacher terms
9. Objectives stated in student terms
10. Objectives in student and teacher terms

Includes information about:

11. Facilities
12. Equipment
13. Personnel requirements
14. Occupational analysis
15. Employment possibilities
16. Curriculum outline
17. Scientific or technical societies or associations
18. Student selection and services
19. Job sheets used in content

Evaluation base:

	None	Little	Ave.	High
Content related to the objectives	21	22	23	24
Validity or technical quality of content	25	26	27	28
Degree of relevance to the project	29	30	31	32
Appropriate learning experiences quantity	36	37	38	39
Appropriate learning experiences quality	40	41	42	43
Evidence of field testing	44	45	46	47
Adequate media or suggested learning material	48	49	50	51
Objectives state precisely what student will do	52	53	54	55
Objectives state clearly how well student should do it	56	57	58	59
Objectives state clearly under what conditions student will perform	60	61	62	63
Concepts or generalizations to be learned are identifiable	64	65	66	67

KEY FOR REVIEWING AND INDEXING K-9 DOCUMENTS

Designation of the material:

1. Curriculum guide
2. Teacher's guide
3. Teacher's and student's guide (combination)
4. Student manual with teacher direction
5. Self-study guide for student
6. Knowledge approach (teaching strategy)
7. Occupation approach (teaching Strategy)
8. Objectives stated in teacher terms
9. Objectives stated in student terms
10. Objectives in student and teacher terms

Includes information about: Careers - specific

11. Facilities
12. Equipment
13. Personnel requirements
14. Occupational analysis
15. Employment possibilities
16. Curriculum outline
17. Scientific or technical societies or associations
18. Student selection and services
19. Job sheets used in content

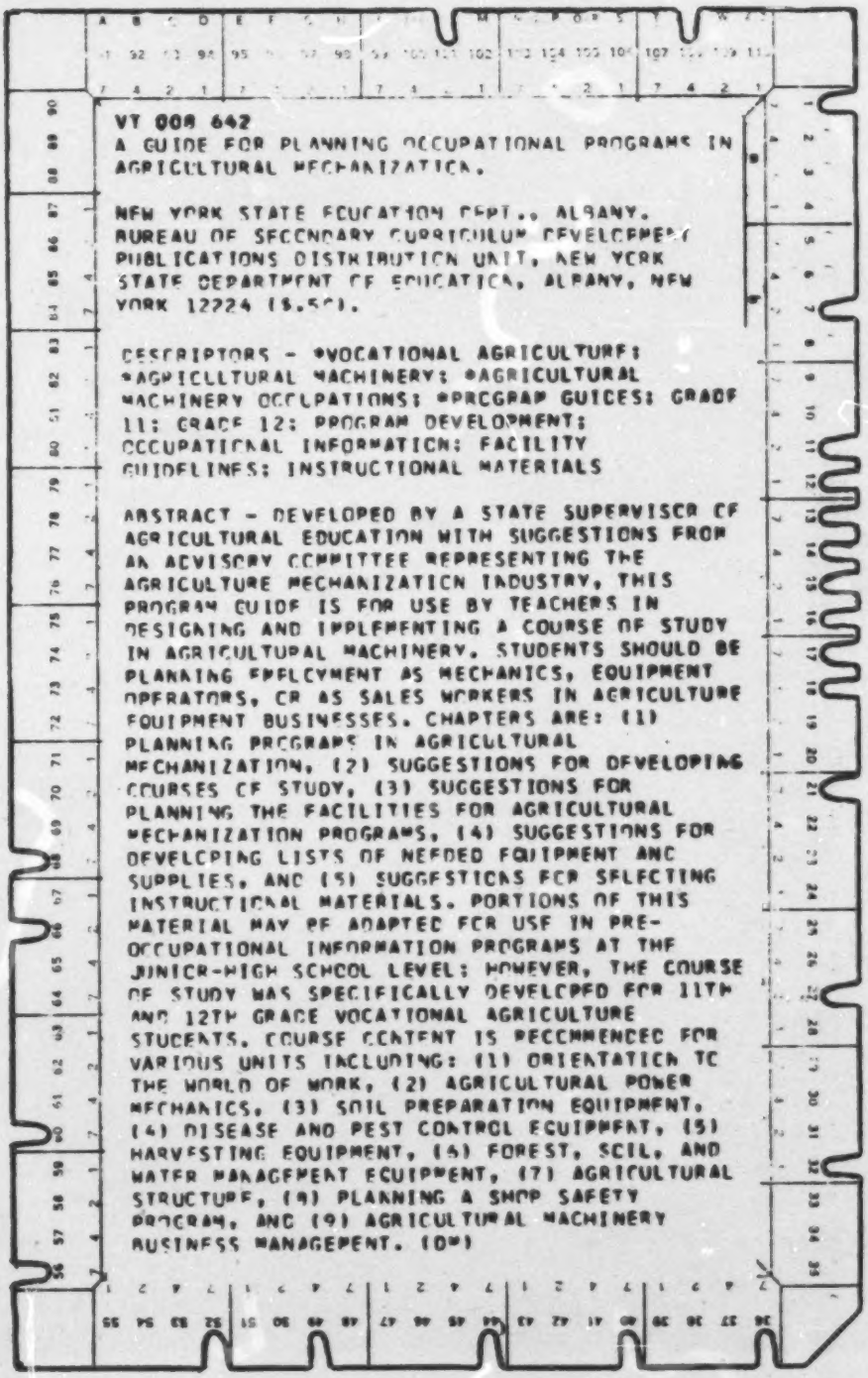
Evaluation base:

	None	Little	Ave.	High
Content related to the objectives ----------	21	22	23	24
Validity or technical quality of content ---	25	26	27	28
Degree of relevance to the project ---------	29	30	31	32
Appropriate learning experiences quantity --	36	37	38	39
Appropriate learning experiences quality ---	40	41	42	43
Evidence of field testing -----------------	44	45	46	47
Adequate media or suggested learning material --- Additional Resources ----	48	49	50	51
Objectives state precisely what student will do ----------	52	53	54	55
Objectives state clearly how well student should do it ----------	56	57	58	59
Objectives state clearly under what conditions student will perform ---------	60	61	62	63
Concepts or generalizations to be learned are identifiable ----------	64	65	66	67

Educational level or department:

73. Elementary K-3
74. Elementary 4-6
75. Elementary K-6
76. Junior High 7-8-9
77. K-9
78. K-12
79. Guidance Counselors
80. Lesson - Outline
81. Lesson - Complete
82. Objectives or concepts and activities
83. Student activity work page
84. Activities only
85. Related subject matter stated
86. Career development approach

Index Card for Recording Document Review Information



VT 008 642
A GUIDE FOR PLANNING OCCUPATIONAL PROGRAMS IN AGRICULTURAL MECHANIZATION.

NEW YORK STATE EDUCATION DEPT., ALBANY. BUREAU OF SECONDARY CURRICULUM DEVELOPMENT; PUBLICATIONS DISTRIBUTION UNIT, NEW YORK STATE DEPARTMENT OF EDUCATION, ALBANY, NEW YORK 12224 ($.50).

DESCRIPTORS - *VOCATIONAL AGRICULTURE; *AGRICULTURAL MACHINERY; *AGRICULTURAL MACHINERY OCCUPATIONS; *PROGRAM GUIDES; GRADE 11; GRADE 12; PROGRAM DEVELOPMENT; OCCUPATIONAL INFORMATION; FACILITY GUIDELINES; INSTRUCTIONAL MATERIALS

ABSTRACT - DEVELOPED BY A STATE SUPERVISOR OF AGRICULTURAL EDUCATION WITH SUGGESTIONS FROM AN ADVISORY COMMITTEE REPRESENTING THE AGRICULTURE MECHANIZATION INDUSTRY, THIS PROGRAM GUIDE IS FOR USE BY TEACHERS IN DESIGNING AND IMPLEMENTING A COURSE OF STUDY IN AGRICULTURAL MACHINERY. STUDENTS SHOULD BE PLANNING EMPLOYMENT AS MECHANICS, EQUIPMENT OPERATORS, OR AS SALES WORKERS IN AGRICULTURE EQUIPMENT BUSINESSES. CHAPTERS ARE: (1) PLANNING PROGRAMS IN AGRICULTURAL MECHANIZATION, (2) SUGGESTIONS FOR DEVELOPING COURSES OF STUDY, (3) SUGGESTIONS FOR PLANNING THE FACILITIES FOR AGRICULTURAL MECHANIZATION PROGRAMS, (4) SUGGESTIONS FOR DEVELOPING LISTS OF NEEDED EQUIPMENT AND SUPPLIES, AND (5) SUGGESTIONS FOR SELECTING INSTRUCTIONAL MATERIALS. PORTIONS OF THIS MATERIAL MAY BE ADAPTED FOR USE IN PRE-OCCUPATIONAL INFORMATION PROGRAMS AT THE JUNIOR-HIGH SCHOOL LEVEL; HOWEVER, THE COURSE OF STUDY WAS SPECIFICALLY DEVELOPED FOR 11TH AND 12TH GRADE VOCATIONAL AGRICULTURE STUDENTS. COURSE CONTENT IS RECOMMENDED FOR VARIOUS UNITS INCLUDING: (1) ORIENTATION TO THE WORLD OF WORK, (2) AGRICULTURAL POWER MECHANICS, (3) SOIL PREPARATION EQUIPMENT, (4) DISEASE AND PEST CONTROL EQUIPMENT, (5) HARVESTING EQUIPMENT, (6) FOREST, SOIL, AND WATER MANAGEMENT EQUIPMENT, (7) AGRICULTURAL STRUCTURE, (8) PLANNING A SHOP SAFETY PROGRAM, AND (9) AGRICULTURAL MACHINERY BUSINESS MANAGEMENT. (DM)

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GENERAL SUMMARY OF DOCUMENTS REVIEWED

K-9 Summary

The total number of documents reviewed and indexed in the K-9 level was 92. The breakdown of these 92 documents by grade level is shown in Table 1.

Table 1

Documents Indexed by Grade Level

Specific to K-3 level	11
Specific to 4-6 level	11
Specific to K-6 level	23
Specific to 7-9 level	25
Other documents spanning or combinations within K-12	22

The documents were also indexed by their major intended use which is shown in Table 2.

Table 2

Documents Indexed by the Type of Use

Curriculum guide	39
Teacher' guide	46
Other (combination of teacher and/or student manual)	47

Teaching Strategy by Use of Document

The identification of an occupational approach to the teaching strategy was primarily meant for use at the vocational preparation level. Nearly one-fourth of all the documents at the K-9 level were also determine to have some form of occupational approach in the teaching strategy. The summary of the number of documents within each strategy and the type of documents is shown in Table 3.

Table 3

Teaching Strategy by Use of Document

	Knowledge	Occupational
Curriculum guide	24	11
Teacher's guide	39	6
Other	2	4

Number of Documents with Career Development Approach

The number of documents which contained a career development approach is summarized for each type of document in Table 4.

Table 4

Number of Documents with Career Development Approach

Curriculum guides	31
Teacher's guide	23
Other	3

Number of Documents Which Defined Related Subject Matter

The infusion of career development material into existing curriculum is facilitated by defining the related subject matter. A review of the documents for this element determined that 39 of the documents did provide a means for relating the contents of the document to subject matter area. Table 5 shows the documents identified as relating content to subject matter.

Table 5

Number of Documents Which Define Related Subject Matter

Curriculum guide	23
Teacher' guide	15
Other	1

Use of Objectives

Objectives served as a basis for developing many of the other elements of the curriculum. The review indicated that less than half of the documents contained any form of objectives. Of those objectives which were used, the major facet of student behavior identified was WHAT the student will do. Very little was done to define HOW WELL or under WHAT CONDITIONS the student was to demonstrate his accomplishment of the objectives. This suggests that there is considerable need to develop both the amount and quality of objectives in the curriculum guides.

Level of Objectives

The primary level of objectives sought was that written in student terms. Table 6 shows the number of documents in which the objectives were clearly stated in student terms as well as those which had a combination of student and teacher objectives, and those which only used objectives in teacher terms.

Table 6

Level of Objectives

	Curriculum Guides:	Teacher's Guides:
Stated in student terms	9	5
Stated in teacher terms	2	17
Stated in both teacher and Student terms	12	5

Statement of Objectives

It was determine that, for some of the elements, there would be a definite advantage to know the degree, amount or quality of these elements. A four-level rating was used, consisting of: 1) none, 2) little, 3) average or 4) high. Table 7 includes the number of documents where the objectives were evaluated as to whether they contained the WHAT, HOW WELL and THE CONDITIONS for performance. The WHAT, HOW WELL and THE CONDITIONS part of each objective statement was quality rated by "little" for those that stated the WHAT in an ineffective manner, an "average" rating for those which were more adequate but were somewhat inadequate, and a "high" rating when they were very explicit and quite adequately stated. The same quality rating was done for the HOW WELL and THE CONDITIONS statements. It was noted that the WHAT conditions of objectives are much more commonly used in the K-9 guides with THE CONDITIONS statement in the objectives seldom used.

Content Related to the Objectives

A review of the content of those guides having objectives showed that a high proportion of the objectives related well to the content.

However, it was also determined that, of those guides having some form of objectives, approximately 10 per cent had conditions of poor or unacceptable relationship between objectives and content.

Table 7

Statement of Objectives

Objectives State Specifically What Student Will Do

Little	2
Average	17
High	8

Objectives State Specifically How Well Students Are to Perform

Average	2
High	2

Objectives State Specifically The Conditions Under Which Student Will Perform

Average	1
High	1

Table 8

Content Related to the Objectives

None	4
Little	1
Average	15
High	15

Quantity and Quality of Learning Experiences

The K-9 documents typically were found to be prepared with considerable attention to suggested learning activities. In order that the differences in types of students or differences in programs or resources are considered, it is necessary to provide a variety of learning experiences to be useful under the varied condtions. Table 9 lists the number of documents which were found to have "none" or " little" listing of learning experiences and those which had an "average" or very adequate "high" number of exepriences. The learning experiences were also evaluated in terms of how well they supported or aided achieving the objectives.

Table 9

Quantity and Quality of Learning Experiences

	Quantity	Quality
None	8	8
Little	12	3
Average	39	48
High	30	28

Media and Concepts

Each document was reviewed to determine how adequately appropriate media and related teaching resources were mentioned in the documents to support the teaching process. Table 10 lists the review findings for the number of documents which listed desirable teaching resources. Table 11 shows the number of documents which stated concepts of the curriculum areas.

Table 10

Adequate Media and Resources

None	21
Little	6
Average	35
High	28

Table II

Concepts Defined

Little	3
Average	25
High	20

Field Testing of Documents

Table 12 shows that the evidence of field testing was vastly lacking. There is no easy way, without contacting the producers of the materials, to know whether it is a lack of testing or merely a lack of reporting the testing of the document.

Many documents are apparently put on the market with little or inadequate field testing. Attention to this condition could be a great help in validating the documents. Curriculum developers could provide a valuable service by including a thorough report of the type of field testing, the processes involved and the results.

Table 12

Field Testing of Documents

None	69
Little	10
Average	5
High	7

Summary of the Vocational Documents

The number of curriculum documents defined and reviewed varied greatly among the eight program areas. The total varied from a high of 115 in the area of Agricultural Equipment and Mechanics to a low of nine in Agricultural Products (Food Processing). Additional search activities were conducted in the Agricultural Products area to locate more documents. However, the responses to the additional efforts indicated that very little work has been done on vocational food processing curriculum development.

Table 13 contains the summary data on the numbers of documents reviewed and indexed according to the uses of the documents for each program area.

The summary of the eight program areas is provided in Table 14. The two-way matrix will define the status of one or more of the elements for each program separately by reading the vertical dimensions of the tables. The status of any one element can also be determined for one or more of the program areas by reading the horizontal dimensions of the table. This matrix design of the three pages of Table 14 is the final summary presentation of the documents reviewed in the vocational preparation level.

Table 13

Summary of the Types of Guides by Program Areas

	Curriculum Guide	Teacher's Guide	Teacher's & Student's Guide (Combination)	Student Manual	Self-Study Guide	Total
Agricultural Production	15	49	2	1	8	75
Agr. Supplies and Services	13	35	0	15	4	67
Agr. Equipment and Mechanics	17	62	3	28	5	115
Agr. Products (Food Processing)	1	0	6	0	2	9
Ornamental Horticulture	41	42	4	14	1	102
Agricultural Resources	6	6	5	1	1	19
Forestry	5	6	5	0	4	20
Environmental Protection	3	7	2	8	5	25
Totals	101	207	27	67	30	432

Table 14

VOCATIONAL CURRICULUM GUIDE SUMMARY

	Key Number	1. Agr. Production	2. Agr. Supplies and Services	3. Agr. Equipment and Mechanics	4. Agr. Products (Food Processing)	5. Ornamental Horticulture	6. Natural Resources	7. Forestry	8. Environmental Protection	Total
Total evaluated		75	67	115	9	102	19	20	25	432
Curriculum guides	1	15	13	17	1	41	6	5	3	101
Teacher's guides	2	49	35	62	0	42	6	6	7	207
Teacher - student guide (combined)	3	2	0	3	6	4	5	5	2	27
Student manual with teacher direction	4	1	15	28	0	14	1	0	8	67
Self study guide for student	5	8	4	5	2	1	1	4	5	30
Knowledge approach	6	54	32	5	2	23	9	7	17	149
Occupation approach	7	20	29	110	7	75	12	13	8	274
Objectives stated in teacher terms	8	1	5	9	0	6	2	1	10	34
Objectives stated in student terms	9	64	29	40	3	58	2	5	5	206
Objectives in student & teacher terms	10	0	17	23	4	7	7	10	3	71
Facilities	11	1	4	14	2	16	6	5	10	58
Equipment	12	1	12	46	2	12	5	5	12	95
Personnel requirement	13	0	16	15	0	6	5	4	7	53
Occupational analysis	14	8	18	16	0	40	4	2	8	76
Employment possibilities	15	8	25	22	0	37	3	2	6	103
Curriculum outline	16	21	59	94	1	68	7	10	2	262
Scientific or tech. societies or assoc	17	1	52	83	0	2	3	2	3	146
Student	18	1	3	10	0	3	1	0	3	21

Table 14 -- Continued

		Key Number	1. Agr. Production	2. Agr. Supplies and Services	3. Agr. Equipment and Mechanics	4. Agr. Products (Food Processing)	5. Ornamental Horticulture	6. Natural Resources	7. Forestry	8. Environmental Protection	Total
Content related to objectives	None	21	4	7	16	2	4	7	0	3	43
	Little	22	3	17	2	0	9	1	2	2	36
	Ave.	23	23	12	35	4	48	2	8	7	139
	High	24	45	22	42	4	37	9	8	12	179
Validity or tech. quality of	N	25	2	6	10	0	5	0	2	0	25
content	L	26	0	10	12	0	1	0	1	0	24
	A	27	19	29	47	5	47	5	10	5	168
	H	28	54	19	44	4	49	13	7	19	209
Relevance to project	N	29	0	0	0	0	0	0	0	0	0
	L	30	10	12	22	2	7	1	2	0	56
	A	31	54	38	61	3	65	10	6	15	252
	H	32	11	16	32	4	22	8	10	11	113
Learning experiences ---	N	36	2	8	11	0	6	6	1	0	34
quantity	L	37	1	15	15	0	4	3	6	5	49
	A	38	21	30	52	5	63	5	7	9	192
	H	39	51	8	37	4	29	5	6	11	151
Learning experiences ---	N	40	4	5	11	0	7	6	1	0	34
quality	L	41	1	10	10	2	5	3	3	1	35
	A	42	19	20	22	4	60	5	9	16	150
	H	43	51	29	72	3	30	5	7	8	200

Table 14 -- Continued

		Key Number	1. Agr. Production	2. Agr. Supplies and Services	3. Agr. Equipment and Mechanics	4. Agr. Products (Food Processing)	5. Ornamental Horticulture	6. Natural Resources	7. Forestry	8. Environmental Protection	Total
Field tested	N	44	107	49	98	8	96	17	20	18	396
	L	45	0	14	14	0	3	1	0	7	39
	A	46	0	2	2	1	1	0	[illegible]	0	6
	H	47	0	0	1	0	1	2	0	0	4
Adequate Learning material	N	48	0	1	10	0	12	1	1	1	30
	L	49	2	14	19	2	4	3	5	6	55
	A	50	41	29	54	5	50	10	10	7	206
	H	51	32	22	32	2	34	5	4	11	142
Obj. --- what student will do	N	52	9	15	47	1	26	9	2	[illegible]	118
	L	53	33	26	29	4	47	4	6	7	156
	A	54	19	17	27	3	21	4	8	6	105
	H	55	14	4	10	1	8	2	4	3	46
Obj. --- how well student will do	N	56	9	20	50	1	29	8	2	11	130
	L	57	33	23	31	6	49	5	11	9	167
	A	58	19	18	27	1	14	3	7	3	92
	H	59	14	6	7	1	10	2	1	2	43
Obj. --- under what conditions	N	60	9	20	56	1	29	8	2	9	134
	L	61	29	27	32	4	48	5	12	12	169
	A	62	23	15	23	3	17	5	4	3	93
	H	63	14	4	7	1	8	1	2	1	38
Concepts identified	N	64	1	0	0	1	10	1	1	0	14
	L	65	2	11	8	4	15	5	7	2	54
	A	66	6	33	54	3	30	10	7	14	157
	H	67	65	22	52	1	47	4	5	8	204

FINAL REPORT

CAREER DEVELOPMENT -- CURRICULUM GUIDES

CLUSTER AREAS OF AGRIBUSINESS, RENEWABLE NATURAL RESOURCES, AND ENVIRONMENTAL PROTECTION

by

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VOCATIONAL EDUCATION AMENDMENTS OF 1968, PUBLIC LAW 90-576

BY

OHIO CAREER EDUCATION AND CURRICULUM
MANAGEMENT LABORATORY IN AGRICULTURAL EDUCATION
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO 43210
1974

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PREFACE

The Career Awareness and Career Exploration curriculum guides, two of ten guides, were developed under the direction of the Ohio Career Education and Curriculum Management Laboratory, Department of Agricultural Education, College of Agriculture, The Ohio State University, as a part of the project entitled "Curriculum Development Basic to the Training of Individuals for Employment in Agribusiness, Natural Resources, and Environmental Protection." This project was funded under a contract with the Bureau of Adult and Vocational Technical Education, United States Office of Education.

Because educators are lacking adequate and accurate information for the career awareness, exploration, and preparation stages for the career development in the agribusiness cluster, it was determined that ten comprehensive curriculum guides would be developed. The articulation plan used to present this particular cluster of occupations was developed in such a manner that each guide would build upon or enlarge the experiences provided in each preceding guide; i.e., the K-6 guide provides an awareness of this cluster, and the 7-9 guide provides exploration experiences as a basis for selecting courses at the preparation level, grades 10-12, for which eight guides have been prepared. The guides at the preparation level were developed to provide occupational competencies and related curriculum in established areas as well as in several emerging areas of Agribusiness, Natural Resources, and Environmental Protection.

ACKNOWLEDGMENTS

These curriculum guides were prepared to create an awareness of the agricultural occupations as well as to develop career development concepts. They are a part of a comprehensive project to develop ten articulated curriculum guides -- one K-6 guide on the career awareness level, one 7-9 guide for the career exploration level, and eight 10-12 guides on the preparation level. With the assistance of Mr. Roger Roediger, the prime contract director at The Ohio State University, the agricultural concepts and occupations were selected and developed for these guides. Dr. Marla Peterson, Director of the Enrichment of Teacher and Counselor Competencies in Career Education Project at Eastern Illinois University, provided the Career Development Concepts which were developed in each module.

Dr. Charles Joley of the Center of Educational Studies, Eastern Illinois University, Charleston, Illinois, served as on-site monitor, and the late Dr. Philip Teske of the United States Office of Education served as monitor from that office.

Many thanks go to the consultants, Dr. Robert Walker, Dr. Marla Peterson, Dr. Richard Hoffstrand, Dr. Dale Downs, Mrs. Mary Bare, and Miss Sandy Boll, who spent many hours reviewing the materials and giving their suggestions for improvement. This project would not have been accomplished as smoothly if I had been without the able assistance of Mrs. Janet Ruddell. Mrs. Barbara Funk provided secretarial services, second to none. The technical assistants, Mrs. Diane Kelleher, Mrs. Betty Elliott, and Mrs. Anita Shaeffer, provided the basic research needed to accomplish the project's goals. Mrs. Elliott also served as a pilot tester of the primary materials.

Special thanks go to Mr. Roger Roediger for providing a "creative" atmosphere and a great deal of latitude in the development of these curriculum guides. He and Doctor Joley were very understanding of the needs of this staff and made every effort to provide for those needs.

It is with a great deal of gratitude that I thank Dr. Harry Merigis, Dean of the School of Education for his encouragement in procuring this contract. It is also important to thank Dr. Gilbert Fite, President of Eastern Illinois University, for having the foresight to provide the atmosphere where the staff has the opportunity to engage in curriculum development of this nature.

Many people were used as resource persons. The prime people providing subject matter and occupational information relevant to the modules being developed and reviewers of the modules for accuracy were the developers of the career preparation materials for grades 10-12. These people were project staff members in the School of Agricultural Education at The Ohio State University, Columbus, Ohio.

Other resource persons were Mr. Billy L. Rich, Chairman of the Agriculture Department, Lakeland Junior College, Mattoon, Illinois; Mr. Terry Atchison, Cooperative Extension Service of the University of

Illinois, Charleston, Illinois; Mrs. Beverly Foote, Agronomist, Charleston, Illinois; Mr. Albert Weaver, Christmas Tree Farmer, Lerna, Illinois; Staff Members of Eastern Illinois University, Charleston, Illinois: Dr. Louis Grado, Chairman of the Department of Elementary and Junior High School Education; Dr. Thomas Floyd of the Department of Elementary and Junior High School Education; Dr. Donald Gill, Principal, Buzzard Laboratory School, K-9; Dr. Richard Funk, Dr. Michael Goodrich, Dr. Garland Riegel, and Dr. Leonard Durham of the Department of Life Science; Mr. Richard Lawson, Library Science Department; Mr. Paul Ruddell, Physics Department; Dr. H. F. Thut, professor emeritus, Botany Department; Mrs. Rose Mary Shepherd and Miss Susan Zorn, English Department; and Dr. Thomas Elliott, School of Business.

The staff and consultants of this Career Education Curriculum Development Project worked very diligently to fuse the agricultural occupational information and the career development concepts with suitable grade level subject matter so that a module of learning experiences would emerge which should not only broaden the child's occupational horizons, but also further his career development.

Dorothy M. Lawson

Project Director

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PURPOSE OF THE PROJECT

As a result of the Vocational Education Act of 1963 and the 1968 amendments, education is now being more directly oriented toward realistic preparation of all students for their placement in the world of work. This includes an awareness of the infinite variety of occupations, the exploration of occupational clusters, the orientation of a student toward his career choice and preparation of that student in the knowledge and skills required to be competent in his chosen career.

Since children learn more easily and retain that learning longer through experiences, these curriculum guides attempted to provide as many concrete experiences as possible. These experiences develop the career development concepts and use subject matter in realistic "work situations," either through simulations or field explorations, because we believe Career Education has the potential to provide a very relevant education for all types of students. The activities used in this project provide educational experiences for many levels and interests of children. Hopefully, by being exposed to occupations in this cluster area, students will be able to make realistic career decisions based on experiences rather than fantasy, will be able to understand the relevance of their educational experience in their occupational plans, and will gain an appreciation of every man's work which provides the type of society and lifestyle he selects.

A primary assumption of this project is that career development is an important part of the total development of self. Therefore, it is essential that educational experiences be given each child which will aid in his self-development as a potential member of the "world of work." A secondary assumption is that in order to make a wise career decision students must be given opportunities to make decisions using the decision-making process. Students have difficulty in making a critical career choice when they have not been provided visible "world of work" experiences, have not been involved in the decision-making process, or have not participated in any work experiences associated with their career choice.

The development of these guides is but a part of the materials and experiences in a total Career Education program. The use of these guides can provide an exposure to a wide variety of possible careers in the areas of Agribusiness, Renewable Natural Resources, and Environmental Protection so that the young adult can make a career choice on the basis of his self-knowledge, his particular needs, abilities, interests, and the needs of society.

MAJOR OBJECTIVES

The total effort of the prime contract was to

1. Identify the major agribusiness, natural resources, and environmental protection occupational categories.

2. Determine the state of the art in curriculum development in the major instructional areas of agribusiness, natural resources, and environmental protection.

3. Develop, validate, and disseminate curriculum guides for use in Career Education in agribusiness, natural resources, and environmental protection areas for grades K-6, 7-9, and 10-12.

The objectives for this subcontract were to

1. Develop two Career Education curriculum guides in the areas of agribusiness, natural resources, and environmental protection.

   a. One for career awareness (K-6).

   b. One for career exploration (7-9).

2. Evaluate and field test the guides.

3. Aid the prime project director in the dissemination of the curriculum guides.

Every project needs to define what it is all about. The project needs to set goals that are realistic. This project divided its objectives into the three major categories: Cognitive, Affective, and Psychomotor.

The Psychomotor objectives were most easily defined.

1. Write two legible curriculum guides.

2. Draw accurate illustrations for each of the modules and the cover.

3. Design a useable format for the individual modules.

4. Design a useable format for each guide.

5. Develop an articulation scheme.

6. Construct two matrices -- one for the K-6 guide, one for the 7-9 guide.

Types of psychomotor activities for the students can be seen on the list in Figure 1.

FIGURE 1

EVALUATION OF UNITS

OCCUPATION THEME

CAREER DEVELOPMENT CONCEPTS (ETC)

CAREER DEVELOPMENT EMPHASIS (CDCP)

KINDS OF ACTIVITIES	NO.	GROUP	INDIVIDUAL	LEVEL OF DIFFICULTY easy 1 2 3 4 5 difficult
Displays				
Field trips				
Interviewing				
Research				
Writing				
Constructing				
Drawing				
Collecting				
Discussions				
Listing				
Experiments				
Assessing				
Map reading				
Reporting				
Identifying				
Surveying				
Measuring				
Gathering				
Comparisons				
Planning				
Designing				
Speech making				

Through research it was determined what would be the cognitive objectives; that is, what knowledge and skills would be presented to be developed through the use of the curriculum guides.

1. Select language arts, social studies, science, and mathematics subject matter as the major vehicles for introducing careers (See Appendix C in curriculum guides).

2. Define agricultural areas (See Appendix A in curriculum guides).

3. List basic occupational information.

4. Integrate subject matter with career development concepts and the cluster generalizations.

5. Judge the value of a module by use of internal criteria (see Figure 1).

6. Judge the value of a curriculum guide by use of external criteria (see Figures 2 and 3).

To show how our affective objectives were to be met, some samples of the objectives written for the various modules are listed below:

1. Provide an awareness of the importance of learning.

   a. . . . state reasons why a person interested in a career as an irrigation engineer would need to know and understand geography and science (Irrigation Engineer - Elementary Module).

   b. . . . state an important reason why workers must keep learning while working at their job (Truck Farmer - Elementary Module).

   c. . . . express in writing the relationships of training and experience with increased production and earning potential (Supplies and Services - Junior High Module).

2. Provide for the sensitivity to human needs and social problems.

   a. . . . list a number of decisions that a florist must make and tell how each decision might affect the florist, his staff, and/or his customers (Florist - Elementary Module).

   b. . . . name some of the problems caused by our technological society which creates a demand for environmental technicians (Environmental Technician - Elementary Module).

   c. . . . role play the best and worst ways to cope with the rights and feelings of a fellow worker (Agricultural Products (Food Processing) - Junior High Module).

3. Provide for systematic planning for solving problems.

   a. . . . name some of the jobs in your classroom that must be done in order for each school day to go smoothly and tell what would happen if the person responsible for each job failed to do it (Agronomist - Elementary Module).

   b. . . . outline some of the chain reactions which occur when a career decision is made (Livestock Producer - Elementary Module).

   c. . . . list some ways the employee can plan for economic changes (Agricultural Equipment and Mechanics - Junior High Module).

4. Provide for the development of responsibilities for behavior.

   a. . . . cite several ways in which the individual can help protect the park environment (Park Ranger Naturalist - Elementary Module).

   b. . . . list the duties of the environmental technician (noise) which require him to be extremely dependable /Environmental Technician (Noise) - Elementary Module/.

   c. . . . write a paragraph listing the affect of lateness, undependability, or excessive absence on the ability to complete or keep a job /Agricultural Products (Food Processing) - Junior High Module/.

   d. . . . list some of the work habits needed to hold a job and match them to the individual's work habits (Ornamental Horticulture - Junior High Module).

5. Provide opportunities to understand individual strengths and limitations.

   a. . . . define the importance of good eyesight, physical strength and endurance in performing the tasks required of the farm equipment mechanic (Farm Equipment Mechanic - Elementary Module).

   b. . . . write a paragraph explaining the affect of actual experiences versus daydreaming experiences on making career decisions (Livestock Producer - Elementary Module).

6. Provide for the formation of a life in harmony with abilities, interests and beliefs.

   a. . . . list job options a person may have and tell how they affect the lifestyle of an individual (Irrigation Engineer - Elementary Module).

b. . . . assess one's own ability to acquire the additional knowledge and skills needed for occupational competence in this area (Agricultural Supplies and Services - Junior High Module).

c. . . . write a paragraph concerning the reasons why replanning of career plans may be necessary (Environmental Protection - Junior High Module).

7. Provide for the acceptance of difference of race and culture.

a. . . . draw pictures of the workers who help the truck farmer in planting, harvesting, and/or marketing the vegetables (Truck Farmer - Elementary Module).

8. Provide experience which relates the role of all subjects in everyday life.

a. . . . draw some pictures of an agronomist performing various duties and tell where he could have learned to do each duty -- at school, out of school, or both (Agronomist - Elementary Module).

b. . . . make a list of the math, language arts, science, and social studies skills and knowledge which feed sales personnel use in their job (Feed Sales Personnel - Elementary Module).

c. . . . identify the subject areas in which knowledge and skills would be needed by a person who would select an occupation in this area (Agricultural Supplies and Services - Junior High Module).

FIGURE 2

Teacher _____
School _____

GENERAL EVALUATION OF CURRICULUM GUIDE

YES	NO	
___	___	The product is useable by most teachers as far as format and language is concerned.
___	___	The style of presentation is acceptable.
___	___	The Career Development Concepts have been developed fully enough within the limitations of each teaching module.
___	___	The objectives are clearly stated.
___	___	The activities designed are appropriate and understandable.
___	___	There is adequate fusion of the subject matter within the activities.
___	___	The activities provide an adequate variety of experiences.
___	___	The materials provide a wide enough range of difficulty to include every child into some activity.
___	___	The suggested references are supportive for the study areas.
___	___	The evaluation or culmination activities suggest a variety of means to test the acquisition of the main Career Development Concept objective.
___	___	The occupational areas are relevant to and make significant contributions for obtaining career information as well as furthering career development.

FIGURE 3

EVALUATION OF CURRICULUM GUIDE

REVIEWER'S NAME _____

___ CLASSROOM TEACHER ___ COUNSELOR ___ CURRICULUM SPECIALIST ___ PRINCIPAL

MEMBER OF CAREER EDUCATION CURRICULUM SELECTION OR DEVELOPMENT COMMITTEE:

___ YES ___ NO

Directions For Review:

The statements below pertain to the components included in the curriculum guide. If you determine the component in the module measures up to standard as stated, place a check mark (X) in the YES margin. Whenever you determine that the component or a portion of that component in the unit does not measure up to the standard described, place a check mark (X) in the NO margin.

Whenever a NO is checked, please define the nature of the problem for that item on the attached sheet entitled "NATURE OF PROBLEM."

YES	NO		
			STUDENT OBJECTIVES
___	___	1.	The objectives are stated explicitly in student terms as to what the student is to be able to do at the completion of a particular module.
			BASIC CONTENT
___	___	2.	The instructional information defines the areas of study to be presented.
___	___	3.	The guide has adequate content for development of a career education program in the Agribusiness, Renewable Natural Resources, and Environmental Protection clusters.
___	___	4.	The modules adequately fuse career development concepts, subject matter, and career information into learning modules.
___	___	5.	The modules use subject matter in a way which provides educational awareness in various careers.
			STUDENT ACTIVITIES
___	___	6.	The K-6 guide provides adequate experiences for developing an awareness of occupations in the Agribusiness, Renewable Natural Resources, and Environmental Protection clusters.

FIGURE 3 (continued)

YES NO

___ ___ 7. The 7-9 guide provides adequate exploration experiences for students to identify interests and abilities in the Agribusiness, Renewable Natural Resources, and Environmental Protection clusters.

___ ___ 8. The modules provide adequate experiences for developing the career development concepts.

___ ___ 9. The modules provide experiences appropriate to the grade levels of the students.

___ ___ 10. The student activities provide a variety of learning experiences based upon differences of students and variable learning conditions.

REFERENCES OR RESOURCES

___ ___ 11. The suggested references are readily available.

___ ___ 12. The suggested references provide the necessary information for supporting the study areas developed in the modules.

STUDENT EVALUATION

___ ___ 13. The evaluation samples are adequate.

NATURE OF PROBLEM

STATEMENT NO. STUDENT OBJECTIVES

_____ _____

_____

BASIC CONTENT

_____ _____

_____

_____ _____

_____

_____ _____

_____

FIGURE 3 (continued)

STUDENT ACTIVITIES

REFERENCES OR RESOURCES

STUDENT EVALUATION

MAJOR TASK AREAS

The major tasks of this project were to develop two curriculum guides, evaluate and field test them, and aid in the dissemination. Before writing could begin, research had to be made to provide the project staff with the curriculum design to be used; the agribusiness, renewable natural resources, and environmental protection occupational areas information to be taught; and the subject matter areas which could be introduced on each level.

At this time Mr. Roger Roediger began to supply this project with curriculum materials he had received on the K-9 level. Materials were also reviewed in the library of the "Enrichment of Teacher and Counselor Competencies in Career Education Project" and in the library at the Illinois Curriculum Management Center, Springfield, Illinois. Using the "Guides to Free and Inexpensive Materials," letters were sent to gather materials related to this occupational cluster. Also, the Buzzard Laboratory School Library and Instructional Materials Centers at Eastern Illinois University were used as resources for printed materials geared to the K-9 student.

In order to provide an articulation of the K-6 and 7-9 curriculum guides which would coincide with the 10-12 curriculum guides, Mr. Roediger supplied the staff with occupations identified by his researchers as those classified within the areas in which his writers would develop their curriculum guides.

While the staff studied the areas for study being used for the grades 10-12 curriculum guides, they identified subject matter being taught in science, social studies, mathematics, and language arts text books at each grade level. In order to make it possible to integrate the modules into the curriculum, it was determined that the areas or occupations to be emphasized should be in subject matter areas relevant to grade level studies.

Each of the writers for each of the eight cluster areas selected occupations related to the areas to be investigated. These occupations were written on a work sheet (see Figure 4). These eight work sheets were then used to make an elementary articulated plan (see Figure 5).

It was determined that each of the eight areas in the primary and intermediate grades would be represented by a specific occupation. Each area would then have two occupations presented in the elementary materials. The occupations selected for modular development had to meet the following criteria:

1. The occupation selected should be related to subject matter being taught at the specific grade level.

2. The occupation selected would be of high interest for that particular grade level.

3. The occupation selected should be representative of the area to be introducted.

4. The occupation selected is one not usually presented in textbook materials as a career (providing more career awareness).

5. The occupation selected should help keep a balance between types of high school, technical school, and college training (employment requirements) (see Figure 6).

6. The occupation selected should be appropriate to the career development concept which was to be developed.

As an aid to the selection of the occupations, the career development concepts from the ETC project had to be selected carefully to relate with the occupations to be studied. The subject matter of each grade level (see Appendix C in each curriculum guide) and the career development experience level concepts (see Appendix B in each curriculum guide) were analyzed to match each as closely as possible. For example, the occupation of a Peanut Butter Maker was selected from area IV, Agricultural Products (Food Processing) part C - Fruits, Vegetables, and Nuts, and was related to the subject matter concepts counting, labels, inventions, and reasons for working and to the subconcept of the career developmental dimension "Lifestyle" -- *Most people work and there are reasons why people work.*

The junior high school materials work from a study of cluster areas leading to specific occupational studies in the activities provided for individual study. The occupations suggested in the subareas were taken directly from the lists developed at The Ohio State University site. An articulation plan for teaching the units is shown in Figure 7.

The 7-9 grade curriculum materials are also oriented around subject matter and a career developmental dimension. Each major occupational area is subdivided for group or individual study of occupations. The activities suggested for that particular subarea are oriented toward occupational experiences.

Each module has three basic parts: instructional information, instructional activities, and culmination or evaluation activities. The instructional information contains the career development concepts which are developed for that module, the subject matter which is needed to carry through the activities, occupational information (in some cases for the teacher only and in others for the students), and Gronlund-type pupil performance objectives aimed primarily at the career development concepts. The instructional activities for the elementary grades are teacher-directed and are a controlled means of developing the career development concepts. For the junior high or middle school, these teacher-directed activities lead the student into individual or small group activities which are designed to give the student a few "hands-on" experiences with the kind of work encountered in an occupational area of his choice. The culmination or evaluation activities are suggested ways of measuring the objectives set for each module. Because the classroom teacher is the best qualified evaluator in her classroom, she should decide HOW a given knowledge or skill shall be demonstrated and the QUALITY and QUANTITY of knowledge or skill required for a particular child or group of children.

FIGURE 4

ORNAMENTAL HORTICULTURE WORKSHEET

AREA	K	1	2	3	4	5	6
ARBORICULTURE	TREE CLIMBER	TREE SPRAYER	TREE EXPERT	TREE SURGEON	ARBORETUM WORKER	ARBORIST	ARBORI-CULTURIST
FLORICULTURE	FLOWER GROWER	FLORAL DESIGNER	FLORIST RETAIL (Decision Making MC#2)	RETAIL FLOWER SALESMAN	FLOWER SHOP MANAGER	FLORIST WHOLESALER	PEST CONTROL SPECIALIST
GREENHOUSE OPERATION & MANAGEMENT	GREENHOUSE EMPLOYEE	PLANT PROPAGATIONIST	PLANT SCIENTIST	FLOWER GROWER	PLANT GENETICIST	GREENHOUSE MANAGER	ENTOMOLOGIST
LANDSCAPING	LANDSCAPE GARDENER	CAMPGROUND LANDSCAPER	LANDSCAPE ARCHITECT	PARK SUPER-INTENDENT	LANDSCAPE SALESMAN	CEMETERY SUPERINTEN-DENT	LANDSCAPE ARCHITECT
NURSERY OPERATION & MANAGEMENT	NURSERYMAN PRODUCTION MANAGER	NURSERY GROWER	PLANT PATHOLOGIST	NURSERY SALES AGENT (mail order writer)	PLANT BREEDER	NURSERY WORKER	NURSERY SALESMAN
TURF GRASS MANAGEMENT	GOLF COURSE SUPERINTEN-DENT	GROUNDS SUPERINTEN-DENT	PARK FOREMAN	SOD SALESMAN	SOD LAYER	GREENSKEEPER (Coping Behavior MC#2)	TURF PRODUCTION MANAGER

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SUGGESTIONS FOR THE ARTICULATION OF A CAREER AWARENESS PROGRAM IN THE

AREAS	K	1	2
AGRICULTURAL PRODUCTION	Cattle & sheep rancher Cotton farmer Peanut farmer	Poultry farmer Seed grower	*Truck farmer Swine farmer
AGRICULTURAL SUPPLIES AND SERVICES	Veterinarian	*Agronomist Seed salesman	Agricultural teacher
AGRICULTURAL EQUIPMENT AND MECHANICS	Fiber equipment operator	Farm equipment operator	Tool salesman Farm building specialist
AGRICULTURAL PRODUCTS (FOOD PROCESSING)	*Peanut butter maker Blancher operator	Poultry dresser Egg processor Egg grader	Foreman, cured-meat packing plant Meat inspector Cannery worker
ORNAMENTAL HORTICULTURE	Landscape gardener Nursery grower	Tree sprayer Tree expert Park foreman	*Retail florist Flower grower Floral designer
RENEWABLE NATURAL RESOURCES	Animal keeper Recreation farm manager Game farm worker	*Park ranger naturalist Natural history curator Refuge manager Aviary manager	Conservation aide Roadside development engineer
FORESTRY	Forest fireman Chipper operator	Conservation aide technician Lumber grader Wildlife technician	Logging equipment operator Woods foreman Skidway man
ENVIRONMENTAL PROTECTION	*Environmental inspector Range conservationist	Climatologist	Sanitary engineer Air analyst technician Water treatment plant superintendent

*Denotes sample learning module

FIGURE 5

3	4	5	6
Bee keeper Fruit grower	Horse breeder Tobacco farmer Farm manager	*Livestock producer Grain or forage producer Grain elevator manager	Dairy farmer Sugar farmer Agricultural cooperative manager
Entomologist Plant geneticist	Feed mixer Seed mill foreman Animal geneticist Auctioneer	Feed company farm advisor Fertilizer formulation specialist Seed analyst Agricultural chemical product serviceman Agricultural chemist	*Feed salesman Fertilizer inspector Seed grader Aerial spray operator County extension agent
*Farm equipment mechanic Product handling equipment salesman	Inspector & tester of agricultural equipment Agricultural structure designing engineer Rural cooperative utilities salesman	*Irrigation engineer Agricultural equipment parts man Farm building components salesman	Agricultural machinery salesman Soil biologist Soil test analyzer technician Rural electrician Rural carpenter
Sorter	Grader	Meat grader Slaughterer USDA inspector Gelatin plant foreman	*Dairy processing equipment operator (cheese) Milk sampler Butter maker Ice cream maker Dairy technologist Sugar refining foreman
Green house manager Nursery worker Nursery sales agent	Arboriculturist Tree climber Tree surgeon Pest control specialist	*Greenskeeper Turf production manager Sod layer Cemetery grounds keeper	Landscape architect Park grounds technician
Soil conservationist aide Aquaculture technician	Forest ecologist Hunting & fishing guide Line bait dealer	Range conservationist Wildlife research technician Soil scientist	*Fish culturist Forest geneologist Forest recreation technician Laboratory technician (ocean fishing) Fish management specialist Fish farmer
*Forest technician Logger Gum gatherer	*Christmas tree farmer Greenspicker	Pulp wood buyer Tropical forest research director Forest ranger	Forest surveyor Timber stand improvement foreman Sawmill operator Sugar tapper Wildlife technician
Oceanographer Refuse collector Marine quality control technician	*Noise pollution control technician Watershed manager	Water systems foreman Sanitarian Soil conservationist Meteorologist	Estuarine oceanographer Solid waste disposal operator Marine pollution control technician Health physicist Aquatic biologist

FIGURE 5 (continued)

FIGURE 6

OCCUPATIONS INTRODUCED ON THE AWARENESS LEVEL	Grade level of Module	LEVEL OF TRAINING REQUIRED: High School	Technical School	University	Plants	Animals	Production	Processing	Supplies	Services
I. Agricultural Production										
A. Truck Farmer	2	x	x	x	x		x			
B. Livestock Producer	5	x	x	x		x	x			
II. Agricultural Supplies and Services										
A. Agronomist	1			x	x					x
B. Feed Sales Personnel	6	x	x	x		x			x	x
III. Agricultural Equipment and Mechanics										
A. Farm Equipment Mechanic	3	x	x		x	x				x
B. Irrigation Engineer	5			x		x				x
IV. Agricultural Products (Foud Processing)										
A. Peanut Butter Maker	K	x			x			x		
B. Dairy Processing Equip. Oper. (cheese)	6	x	x			x		x		
V. Ornamental Horticulture										
A. Florist	2	x	x		x				x	x
B. Greenskeeper	5	x	x		x					x
VI. Renewable Natural Resources										
A. Park Ranger Naturalist	1			x	x	x				x
B. Fish Culturist	6			x		x	x			x
VII. Forestry										
A. Forest Technician	3	x	x		x	x	x			x
B. Christmas Tree Farmer	4	x			x		x			
VIII. Environmental Protection										
A. Environmental Inspector	K	x	x		x	x				x
B. Environmental Technician (noise)	4		x			x				x
Totals	16	11	10	7	10	10	5	2	2	11

FIGURE 7

SUGGESTIONS FOR THE ARTICULATION

OF A CAREER EXPLORATION PROGRAM IN THE AREAS OF

AGRIBUSINESS, RENEWABLE NATURAL RESOURCES, AND ENVIRONMENTAL PROTECTION

SOCIAL STUDIES

- Agricultural Production
- Agricultural Equipment and Mechanics
- Agricultural Products (Food Processing)
- Renewable Natural Resources
- Forestry
- Environmental Protection

SCIENCE

- All Modules

MATHEMATICS

- Agricultural Production
- Agricultural Equipment and Mechanics
- Forestry
- Environmental Protection

LANGUAGE ARTS

- Agricultural Supplies and Services
- Ornamental Horticulture
- Environmental Protection

HOME ECONOMICS

- Agricultural Products (Food Processing)

INDUSTRIAL ARTS

- Agricultural Equipment and Mechanics
- Forestry

ART

- Ornamental Horticulture

AGRICULTURE

- All Modules

CAREER EXPLORATION

- All Modules

CAREER DEVELOPMENT MATRICES

Figures 8 and 9 show matrices for the fusion of Career Development Concepts, Subject Matter, and Occupational Areas for Study for each of the curriculum guides. The K-6 matrix shows the occupations used in each module, the career development dimension, and the subject matter areas. The 7-9 matrix shows the subareas for which individual or group studies were prepared in each of the major areas, the career development dimension, and the subject matter areas which are fused into modules. By lifting one block from one of the matrices, the viewer of that block is able to identify (by using the curriculum guide) the areas which are fused together into the module.

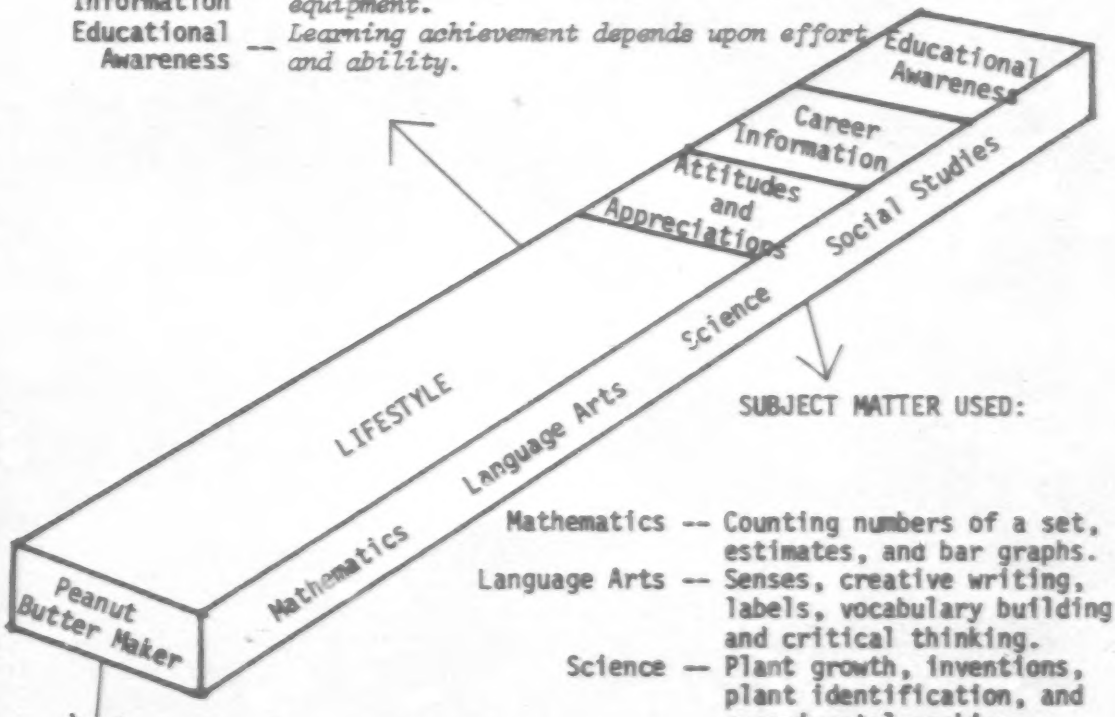
CAREER DEVELOPMENT CONCEPTS:

Lifestyle -- *Most people work and there are many reasons why people work.*

Attitudes and Appreciations -- *A great many tasks can be performed by men and women.*

Career Information -- *Occupations require the use of specific materials and equipment.*

Educational Awareness -- *Learning achievement depends upon effort and ability.*



SUBJECT MATTER USED:

Mathematics -- Counting numbers of a set, estimates, and bar graphs.

Language Arts -- Senses, creative writing, labels, vocabulary building, and critical thinking.

Science -- Plant growth, inventions, plant identification, and experimental cooking.

Social Studies -- Field trips, reasons for working, and geography.

OCCUPATIONAL STUDY AREA OR OCCUPATION:

Peanut Butter Maker
Agricultural Products (Food Processing)

OCCUPATIONAL CLUSTER

AGRIBUSINESS, RENEWABLE NATURAL RESOURCES, AND ENVIRONMENTAL PROTECTION

AGRICULTURAL PRODUCTION
- A. Truck Farmer
- B. Livestock Producer

AGRICULTURAL SUPPLIES AND SERVICES
- A. Agronomist
- B. Feed Sales Personnel

AGRICULTURAL EQUIPMENT AND MECHANICS
- A. Farm Equipment Mechanic
- B. Irrigation Engineer

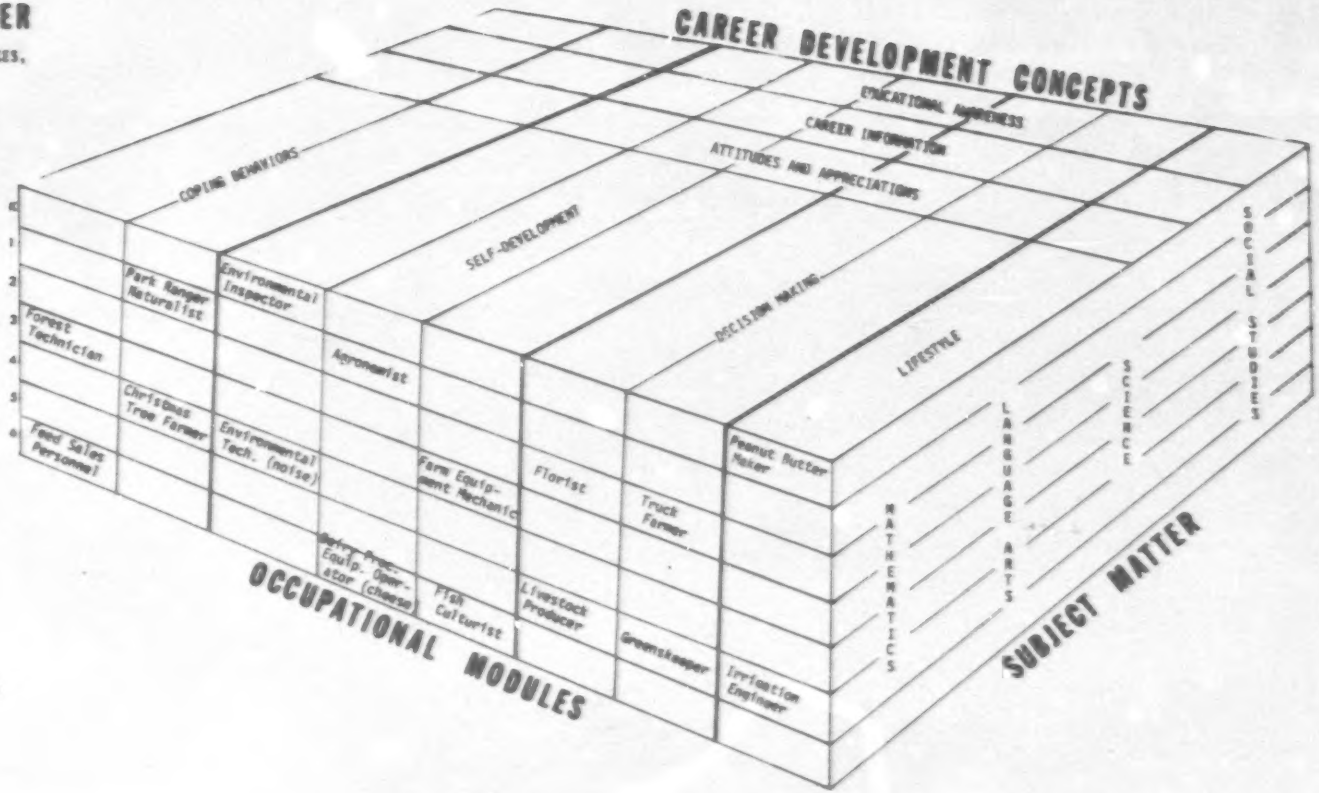
AGRICULTURAL PRODUCTS (FOOD PROCESSING)
- A. Peanut Butter Maker
- B. Dairy Processing Equipment Operator (cheese)

ORNAMENTAL HORTICULTURE
- A. Florist
- B. Greenskeeper

RENEWABLE NATURAL RESOURCES
- A. Park Ranger Naturalist
- B. Fish Culturist

FORESTRY
- A. Forest Technician
- B. Christmas Tree Farmer

ENVIRONMENTAL PROTECTION
- A. Environmental Inspector
- B. Environmental Technician (noise)



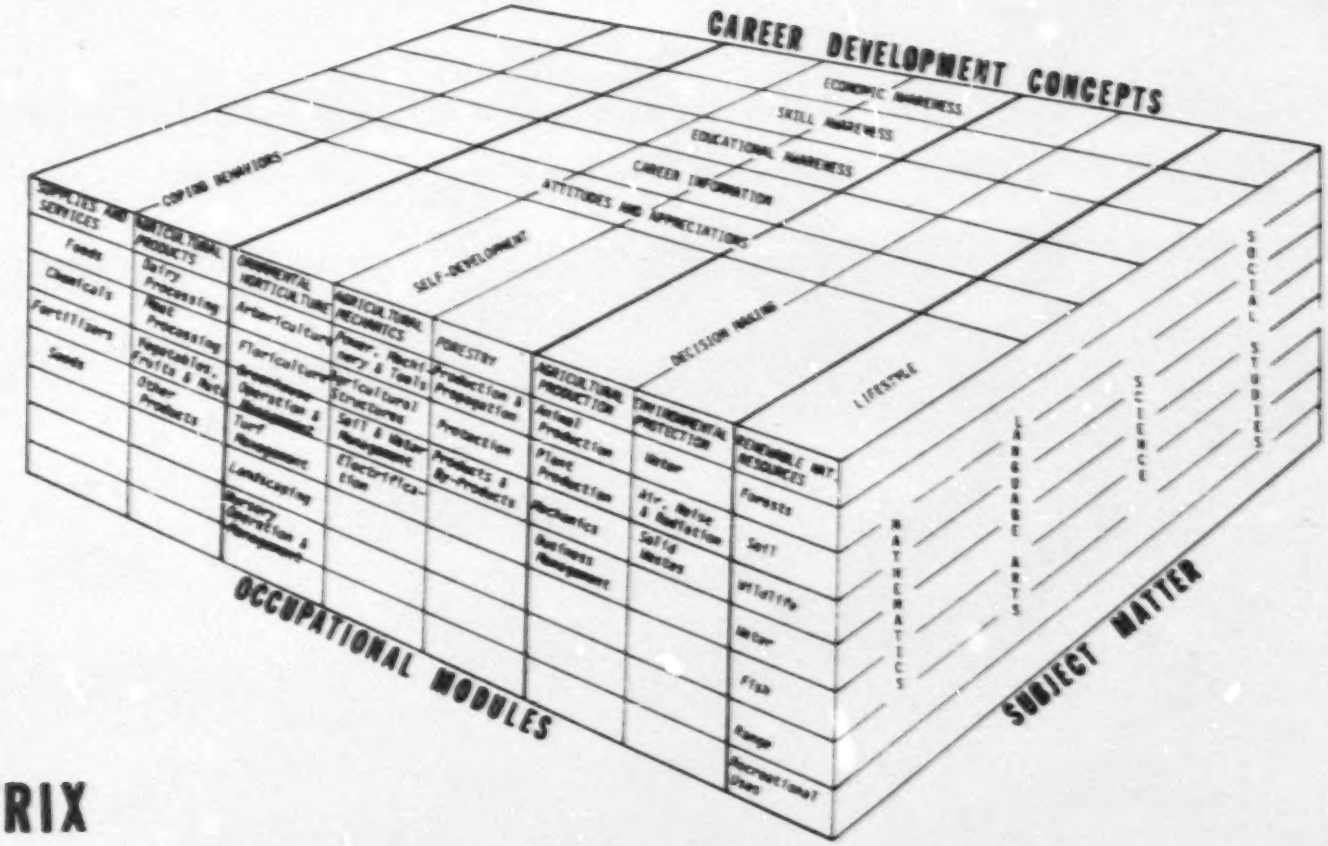
GRAPHIC MATRIX

OF

K-6TH GRADE MODULES

OCCUPATIONAL CLUSTER

AGRIBUSINESS, RENEWABLE NATURAL RESOURCES, AND ENVIRONMENTAL PROTECTION



GRAPHIC MATRIX

OF

7TH-9TH GRADE MODULES

PROCEDURES USED FOR COMPLETING THE TASKS

1. Developed criteria for determining whether existing materials could be adapted to a K-6 and 7-9 career education instructional system.
2. Reviewed K-6 and 7-9 career education materials available from The Ohio State University, the "ETC Project," and the Illinois Curriculum Laboratory.
3. Selected six consultants for the purposes of viewing and validating the curriculum materials.
4. Selected field testing sites.
5. Determined basic agribusiness, renewable natural resources, and environmental protection concepts and generalizations.
6. Selected the career development concepts which would be used.
7. Listed the related subject matter in language arts, science, social studies, and mathematics as taught at each grade level.
8. Developed matrices to show the fusion of occupational information, subject matter, and career development concepts.
9. Determined the objectives for each module with a major focus on career development.
10. Determined a format for the modules.
11. Determined a curriculum guide format.
12. Submitted materials to consultants for review.
13. Developed a variety of student "hands-on" learning activities.
14. Compiled a bibliography of teaching aids and references for each module.
15. Developed samples of student evaluations based on career development concepts.
16. Submitted materials to consultants for review.
17. Submitted guides to field testing.
18. Summarized evaluation findings.
19. Made final revisions of the guides.
20. Sent final drafts for printing to The Ohio State University Curriculum Materials Service.

21. Submitted monthly progress reports.

22. Submitted a final technical report of the development of the curriculum guides.

23. Aided the prime contractor in the development of plans for dissemination of the curriculum guides.

24. Will participate in the National Curriculum Seminar in May, 1974, at Columbus, Ohio.

PERSONNEL

The director and ultimate decision-maker of this total project was Mr. Roger Roediger of the Department of Agricultural Education, The Ohio State University, Columbus, Ohio. The director of the project to develop the K-6 and 7-9 grade level curriculum guides was Ms. Dorothy M. Lawson, Center for Educational Studies, School of Education, Eastern Illinois University, Charleston, Illinois.

Ms. Janet Ruddell, curriculum development coordinator, was given the responsibility for coordinating, reviewing, and writing materials. She also did some of the drawings and all of the charts and graphs for this final report.

Three technical assistants were hired to gather basic information and to develop the basic module activities. Each was assigned two areas in which to develop one module for the 7-9 guide and one primary module and one intermediate module for the K-6 guide. Ms. Betty Elliott, a primary teacher in the Buzzard Laboratory School, gave particular assistance in the development of the primary modules, Ms. Diane Kelleher, an intermediate teacher, gave particular assistance in the development of the intermediate modules and provided much of the art work used in both guides. Ms. Anita Shaeffer, a junior high school science teacher and an Eastern Illinois University graduate student, gave particular assistance in the development of the 7-9 modules. These writers worked as a team as they developed the modules and reviewed the work of one another.

The materials were then reviewed and changes made by the curriculum development specialist and the director. Ms. Rose Mary Shepherd and Ms. Susan Zorn of the English Department at Eastern Illinois University served as editors of the final product. Ms. Barbara Funk, our very efficient secretary, very willingly typed and retyped modules as they progressed from rough draft to editor to final copy.

The consultants were selected because of the uniqueness of their experiences which would give substance to the material being developed. Dr. Marla Peterson, director of the Enrichment of Teacher and Counselor Competencies in Career Education, Eastern Illinois University, gave of her rich guidance and career education background. She was the developer of individualized career education instruction kits known as "OCCUPACS" and is presently developing curriculum guides dealing with the sequential development of career development concepts which were used in the modules. Dr. Robert Walker of the Division of Agricultural Education, Division of Vocational and Technical Education, The University of Illinois, Urbana, Illinois, brought a background of agriculture and guidance. He recently coauthored curriculum materials for "Career Orientation in Applied Biological and Agricultural Occupations" (9th and 10th grade level students) for the Illinois Division of Vocational and Technical Education. Dr. Richard Hoffstrand is a Head Consultant with the Professional and Curriculum Development Unit of the Illinois Division of Vocational and Technical Education, Springfield, Illinois. He brought valuable assistance in the

development of curriculum. Dr. Dale Downs is an intermediate grade supervisor at Buzzard Laboratory School at Eastern Illinois University and works with classroom students and university education students during pre-teaching experiences, student teaching, and graduate studies. Ms. Mary Bare is a junior high school language arts and home economics teacher in the Casey, Illinois, school district. She participated as a field tester for the "OCCUPAC PROJECT" and has been a leader in the State of Illinois in her programs for the gifted. She has been particularly interested in providing relevance of subject matter to the every-day living of her students. Ms. Sandra Boll, a primary grade teacher at Sullivan School District, Sullivan, Illinois, also participated as a field tester for the "OCCUPAC PROJECT." She has a wealth of experience and interest in career education. She tested some of the primary modules in her second grade classroom and worked as a coordinator of field testers in her school district.

Each of the members of the staff and the consultants made many contributions which are immeasurable but were very valuable in the production of the curriculum guides.

REVISION PROCESS

Formative evaluations were undertaken during the developmental period of material preparation for three reasons: first, for the project's use; second, in order to indicate whether the materials were feasible; and third, if not feasible, how to improve. Using the evaluation form (Figure 1), the original revisions of the modules were made at the project site. Special consideration was given to include a variety of experiences at all levels of difficulty. These factors are very important when trying to reach the interests and abilities of children in an average classroom anywhere in the United States.

The original format was reviewed by Mr. Roediger, Dr. Ridenour, the late Dr. Teske, and the project consultants. They gave the "go ahead" to develop the rest of the modules. Because we were concerned with teacher usability, we designed a format familiar to teachers, gave a rationale at the beginning of each module as to why that particular module would be of interest to children, and provided a basic amount of occupational information needed to teach the module.

When all the modules had been completed, a general meeting of the consultants was called to evaluate the total guide. Their input generated some changes. Then the guides were sent to the pilot testing teachers. Next, the pilot testing copies of the guides were presented at a meeting of the consultants for the 10-12 grade guides in Atlanta, Georgia. At this meeting, we were requested to make one major change -- the occupations selected for the modules in the area of Agricultural Production. These modules were rewritten and sent to the pilot testers.

The pilot testing teachers primarily added activities and resources for the modules they taught. Upon receiving the materials from the pilot testers, their suggestions were evaluated and then incorporated into the revised guide. While the guides were being tested, the project staff also enlarged the resource lists and developed more activities in the modules so that each module now contains about sixteen different activities.

The revised guides were given to an editor who checked for consistency of form as well as for the usual composition errors. The guides were then typed in final copy, reorganized, and renumbered for ease of use. The final copy was sent to The Ohio State University for printing. Additional changes are being recorded in a master copy of the second edition.

REVIEW PROCEDURES

A summative evaluation was done after completing the field testing of the materials. Its focus was on describing the effects of the use of the materials by the teachers, circumstances in which their use took place, and their affect on the student body. In our pilot testing, we were primarily concerned with the reactions of the teachers using the materials. Therefore, we did not interview students but relied on comments from the teachers as to their impressions of the effectiveness of the module experiences. We used the interview schedule (Figure 10) and the Teaching Module Questionnaire (Figure 11) to gather these reactions.

FIGURE 10

INTERVIEW QUESTIONS FOR TEACHERS

How would you rate the children's interest in the module?

Did you take any field trips? Why or why not?

Did the activities help in your understanding of what people do who are employed in agricultural occupations? How?

Can you now relate more of the subject matter to agricultural or other occupations since using this guide?

FIGURE 11

TEACHING MODULE QUESTIONNAIRE

NOTE: Complete a "TEACHING MODULE QUESTIONNAIRE" for each Module that you test.

1. Name of Teacher _____ 2. Teaching Level _____

3. Title of Module _____

4. Were activities in the module appropriate for grade level of the students? _____ If not, explain. _____

5. Did the module correlate with subject matter that you normally teach in mathematics, science, language arts or social studies? _____ If not, explain. _____

6. Do you feel the module activities teach the dimension subconcepts for which the materials are written? _____ If not, explain. _____

7. Were there any classroom activities not specifically included in the module which evolved because of the presence of the field testing materials in your classroom? _____ Elaborate. _____

8. How did you evaluate student achievement for this module? _____

9. What is your overall reaction to this module? (Let items such as pupil interest in the activities, ease with which the materials can or cannot be used in the classroom, etc. help guide your response to this question.) _____

10. What suggestions do you have for improving this module? (Do not overlook or omit any suggestions you might have. We have reserved staff

time for further revision of the materials. Your suggestions will be appreciated.) _____

_____

_____

_____

11. Now that you have had some time to become familiar with the materials, how would you use the materials next year? _____

_____

_____

_____

12. Did you try any teaching modules that you would not use again? _____
Which ones? _____

_____

_____

The following reactions were taken from question number 9, Figure 11:

Elementary

I was a little apprehensive about teaching such modules to first graders but was amazed at the interest of my pupils -- both in the job of the park ranger and later the agronomist. They sat for an hour listening to and quizzing the farm advisor.

I felt the module was a very interesting one to use on the kindergarten level. They were very excited about it. The children became interested in factory work and want to make other products using the factory set up.

The boys were turned on. We used electric company men and the children learned a lot.

Students seemed genuinely interested.

High interest level, but found difficulty in securing materials.

Easy to use, enjoyed it, interest keen, we all learned a lot.

Pupil interest high initially, but fell off, perhaps unit too long.

Kept children's interest.

I had to simplify many of the activities; however, I feel the children did gain beneficially and were interested in the topics of this module.

I really feel that there were so many suggested activities that a teacher could fit this module into any age child.

The students loved it. We did Ornamental Horticulture and with the inclement weather it was difficult to go to the nursery, but we finally found a decent day. I feel the class learned more than any book teaching I could have done.

From past experience, I know that children are interested in horses.

Incorporated module with the study of Carver with Black American Week.

Activities fit well into class program.

Never saw the students so enthused about an outside speaker. The suggested studies are good. However, I felt the format of the book was in need of improvement. The children seemed enthusiastic from their evaluation. This study could use a wider range of activities.

This module was easy to incorporate into the fourth grade curriculum both material "wise" and interest "wise" as it was taught just before Christmas when the children were most interested in Christmas trees.

Neither of the units were timely. It is very difficult to find materials on Career Education that can be brought down to our age level. All in all, I felt in spite of all our winter weather problems, my pupils gained a lot of information. Sure wish there could be more visual aids available for each module.

I need more resource materials.

The occupational modules are seasonal, fall or spring, therefore making it difficult to test during the winter.

Activities are not always appropriate in relation to area (geographic) or season of the year.

There are several modules I would like to use, but would like the materials at the start of school to formulate better plans.

I enjoyed teaching the module.

Had a few problems because of time of year, especially bad for field trip plans.

With extra time for planning, these modules could be placed in the calendar to our advantage.

There are several modules I would like to use but would like the materials at the start of the school year to formulate better plans to coincide with the seasons.

I tried only one module. Some do not interest me, however. (YET)

Many of the occupations too far afield from the occupations of the surrounding area and work that is available. Geared to a rural area -- not industrial such as ours. (After visiting this school, the teachers became aware of many agricultural enterprises within two miles of their school. Therefore, this experience provided teachers with an awareness experience for themselves.)

Junior High

Helped to stimulate interest in an area which had been given only a small amount of attention previously.

Good.

Junior high students seemed very interested. I think primarily because the unit is so different than anything they've had.

The basic module is good. I feel the problem and weaknesses encountered were my inadequacies; i.e., failure to research and prepare sufficiently.

The introductory activities need to be revised to be more interesting to a junior high student. My students weren't as enthusiastic about them

as I would have liked. At the onset of the module, the students had little idea of what an environmental inspector did, and the only environmental job the kids could see in the community was the garbage man. We all are more informed now.

Introductory activities not of high enough interest.

It can be coordinated with subject matter courses.

Pupil interest and response was high.

General Data:

The "General Evaluation of Curriculum Guide" was sent to all pilot testers. The results of that survey are recorded in Figure 12. An additional evaluation form was sent to pilot testers whom we did not interview and to curriculum specialists. The results of that evaluation are recorded in Figure 13.

FIGURE 12

GENERAL EVALUATION OF CURRICULUM GUIDE

Elementary YES	Elementary NO	Junior High YES	Junior High NO	
52	2	8	4	The product is usable by most teachers as far as format and language is concerned.
53	2	10	2	The style of presentation is acceptable.
52	2	10	1	The Career Development Concepts have been developed fully enough within the limitations of each teaching module.
53	0	12	0	The objectives are clearly stated.
51	3	8	3	The activities designed are appropriate and understandable.
52	3	9	1	There is adequate fusion of the subject matter within the activities.
54	3	11	1	The activities provide an adequate variety of experiences.
49	6	10	2	The materials provide a wide enough range of difficulty to include every child into some activity.
35	9	10	1	*The suggested references are supportive for the study areas.
47	3	10	1	The evaluation or culmination activities suggest a variety of means to test the acquisition of the main Career Development Concept objective.
44	6	8	2	The occupational areas are relevant to and make significant contributions for obtaining career information as well as furthering career development.

*Some teachers rated this statement as to the availability of the references rather than as to how well the references supported the study areas.

NOTE: Some teachers did not respond to every statement.

FIGURE 13

EVALUATION OF CURRICULUM GUIDE

REVIEWER'S NAME _____

20 CLASSROOM TEACHER 4 COUNSELOR 2 CURRICULUM SPECIALIST 1 PRINCIPAL

MEMBER OF CAREER EDUCATION CURRICULUM SELECTION OR DEVELOPMENT COMMITTEE:

___ YES ___ NO

Directions for Review:

The statements below pertain to the components included in the curriculum guide. If you determine the component in the module measures up to standard as stated, place a check mark (X) in the YES margin. Whenever you determine that the component or a portion of that component in the unit does not measure up to the standard described, place a check mark (X) in the NO margin.

Whenever a NO is checked, please define the nature of the problem for that item on the attached sheet.

YES	NO		
			STUDENT OBJECTIVES
26	1	1.	The objectives are stated explicitly in student terms as to what the student is to be able to do at the completion of a particular module.
			BASIC CONTENT
27	0	2.	The instructional information defines the areas of study to be presented.
24	1	3.	The guide has adequate content for development of a career education program in the Agribusiness, Renewable Natural Resources, and Environmental Protection clusters.
26	0	4.	The modules adequately fuse career development concepts, subject matter and career information into learning modules.
26	1	5.	The modules use subject matter in a way which provides educational awareness in various careers.
			STUDENT ACTIVITIES
* 23	1	6.	The K-6 guide provides adequate experiences for developing an awareness of occupations in the Agribusiness, Renewable Natural Resources and Environmental Protection clusters.
** 8	0	7.	The 7-9 guide provides adequate exploration experiences for students to identify interests and abilities in the Agribusiness, Renewable Natural Resources, and Environmental Protection clusters.

26	0	8.	The modules provide adequate experiences for developing the career development concepts
20	4	9.	The modules provide experiences appropriate to the grade levels of the students.
24	0	10.	The student activities provide a variety of learning experiences based upon differences of students and variable learning conditions.

REFERENCES OR RESOURCES

10	13	11.	The suggested references are readily available.
9	5	12.	The suggested references provide the necessary information for supporting the study areas developed in the modules.

STUDENT EVALUATION

23	2	13.	The evaluation samples are adequate.

* Not applicable to junior high teachers.
** Not applicable to elementary teachers.

NOTE: Some teachers did not respond to every statement.

CAREER EDUCATION INFORMATION AND INSERVICE REQUIREMENTS

We were interested in identifying teacher attitudes concerning Career Education, so a "Career Education Information Inventory" was administered to all pilot testers. The results of that inventory are in Figure 14.

Since we did not present inservice preparation to all teachers, we made a survey on how much preparation they thought was necessary to understand Career Education and the Curriculum Guides (Figure 15). We also asked them to place in rank of priority the inservice activities which they thought would be most beneficial (Figure 16).

FIGURE 14

CAREER EDUCATION INFORMATION INVENTORY

Name _____

Grade level which you are currently teaching _____

Directions: Read each statement carefully and decide how you feel about it. You are offered five possible answers to each statement. The "undecided" answer should be circled only when you have no opinion. Please read each statement and circle

SA: if you strongly agree with the statement
A: if on the whole you would tend to agree
U: if you are undecided
D: if on the whole you would tend to disagree
SD: if you strongly disagree with the statement

This is your individual opinion. Do not consult others regarding the questions.

1.	The focus of the academic disciplines should be related to the career plans of each student.	7 SA	50 (A)	8 U	6 D	2 SD
2.	Most school curricula should be reoriented to place emphasis on career education.	7 SA	42 (A)	10 U	13 D	0 SD
3.	Career information relative to what workers do, where they work, whom they work with, what they wear to work, etc. should be presented in elementary school career education programs.	31 SA	39 (A)	2 U	0 D	0 SD
4.	Career education for girls should center on secretarial skills, nursing, and teaching.	0 SA	2 A	2 U	32 D	38 (SD)
5.	Career education should be integrated into the regular curriculum.	31 SA	44 (A)	0 U	3 D	0 SD
6.	Teaching decision-making skills should not be done in elementary school career education programs since most career-related decisions are not made during the kindergarten through sixth grade years.	5 SA	12 A	8 U	34 (D)	14 SD
7.	Career education should be concerned with developing a positive self-image for each student.	42 (SA)	30 A	1 U	0 D	0 SD

8.	The world of work should be the organizing center for the curriculum in the elementary school.	2 SA	31 (A)	22 U	14 D	1 SD
9.	Learning how to cope with work-related situations should be part of an elementary school career education program.	7 SA	54 (A)	22 U	14 D	1 SD
10.	The type of lifestyle one chooses to lead should not be dealt with in elementary school career education programs.	0 SA	10 A	10 U	43 (D)	8 SD
11.	The choice of an occupation or profession is one of the most important decisions a person makes in his lifetime.	46 (SA)	25 A	0 U	2 D	0 SD
12.	Students presently have sufficient orientation to the possibilities in the world of work to make sound career decisions.	1 SA	2 A	4 U	42 (D)	24 SD
13.	A career education program should involve real life experiences.	29 SA	44 (A)	0 U	0 D	0 SD
14.	Career education should be only for those students who are not able to succeed in an academic program.	1 SA	0 A	2 U	26 D	44 (SD)
15.	Career education should help students develop positive attitudes toward work.	43 (SA)	29 A	1 U	0 D	0 SD
16.	The educational program should provide students with experiences which show the relationship between subject matter taught in school and its use in the world of work.	40 (SA)	31 A	2 U	0 D	0 SD
17.	"Hands-on" experiences are essential to a good career education program.	29 SA	37 (A)	6 U	0 D	0 SD
18.	The primary conveyor of career information should be the teacher.	2 SA	19 A	13 U	31 (D)	8 SD
19.	Career education programs should be introduced only at the junior high school level.	0 SA	2 A	6 U	32 D	33 (SD)
20.	Career education should be taught as a special subject with its own "time slot."	2 SA	7 A	13 U	34 (D)	17 SD

NOTE: Some teachers did not respond to all statements.

FIGURE 15

INSERVICE PREPARATION QUESTIONNAIRE

	Number of Teachers YES	NO
1. Have you had any inservice education in Career Education?	29	34
2. Was the inservice education in your building?	19	0
3. If so, what individual and agency conducted the inservice activities in your building?		
Diane Bernard (ABLE)	3	
Robert Hoskinson (Coordinator for Gifted)	3	
Connie Newtson (Decatur City Schools)	2	
O.S.P.I. (State of Illinois)	8	
Richard Goesel and Dean Wertz (CASE) (Eastern Illinois University)	2 1	
4. Was the inservice education conducted in a geographic location away from your district?	16	0
5. If so, what individual and agency conducted the inservice activities?		
Dorothy Lawson (DVTE and Eastern Illinois University)	14	
(Scott Foresman)	2	

6. How much inservice preparation do you think is needed:

	to understand career education	for this curriculum guide
One-day session at your school	7	27
One-week workshop at your school	17	12
Two- or three-hour session, once a week for 9 weeks at your school	8	6
Two- or three-hour session, once a week for 18 weeks	1	0
One course on university campus	6	0
Several courses on university campus	8	0
Full-time enrollment for 1 year at university	0	0
None	1	1

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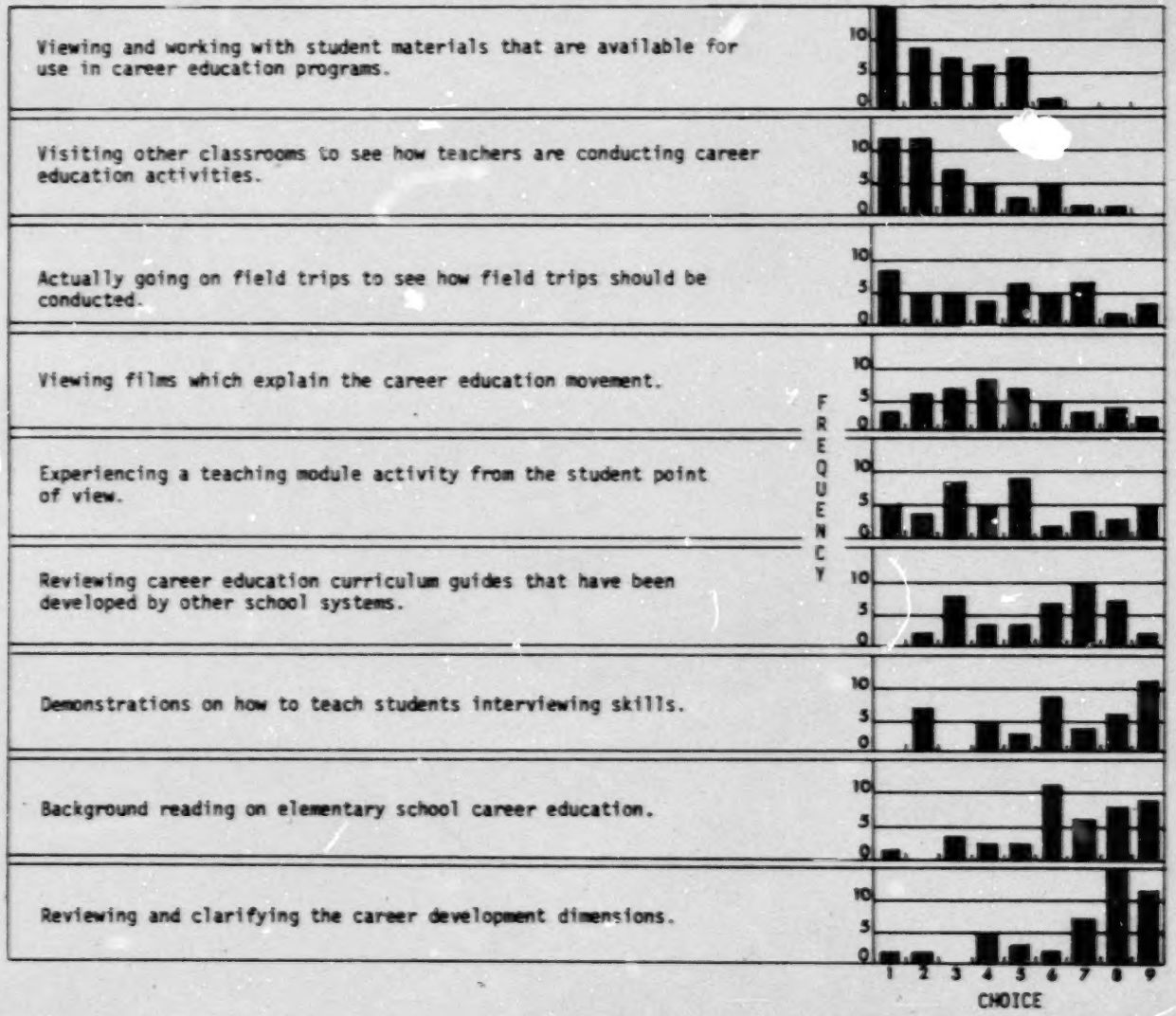
FIGURE 16
INSERVICE ACTIVITIES RANKED IN ORDER OF PREFERENCE BY PILOT TESTING TEACHERS


Viewing and working with student materials that are available for use in career education programs.
Visiting other classrooms to see how teachers are conducting career education activities.
Actually going on field trips to see how field trips should be conducted.
Viewing films which explain the career education movement.
Experiencing a teaching module activity from the student point of view.
Reviewing career education curriculum guides that have been developed by other school systems.
Demonstrations on how to teach students interviewing skills.
Background reading on elementary school career education.
Reviewing and clarifying the career development dimensions.
FREQUENCY
10
5
0
1 2 3 4 5 6 7 8 9
CHOICE

TESTING PROCEDURES, RESULTS, AND CONCLUSIONS

During the school year 1972-73, Ms. Lawson and Ms. Ruddell conducted a series of Career Education Workshops for the Illinois Division of Vocational and Technical Education. Participants were teachers, guidance counselors, and administrators, many of whom asked to be considered as potential field testers if we should ever need their services. Therefore, when a decision was made as to the types of schools in which we wished to field test, we thought of the many teachers who had the interest and were looking for materials to develop career education programs. We also thought, since we had very little time allotted to pilot testing, that perhaps we could capitalize on the previous inservice training given to those participants. Letters were sent to all workshop participants who had attended the total workshop program, and participants from twenty-three schools responded. Our data is based on the information returned at the end of the pilot testing.

The schools selected and some descriptive data can be found in Figure 17. A map of Illinois showing the locations of the various school districts is given in Figure 18.

Because of the Thanksgiving and Christmas holidays and the many snow days, many of the pilot testers did not have adequate time to test the modules. However, they did their best and should be commended for it. Figures 19 and 20 show the results of the pilot testing of each module. Listed in Appendix B is additional information concerning the teachers involved in the pilot testing.

There were a number of problems encountered while pilot testing the materials. All teachers felt pressed for time. November 15th through January 30th is about the busiest time of year for an elementary teacher due to holidays, long vacations, snow days, and illnesses. All teachers who like to use field trips felt the time of year created many problems which would not occur if they could use the modules in the spring or fall. Teachers like to integrate these modules with other units they teach. Some teachers were not flexible enough to teach units in the winter which they would normally teach in the spring or fall. Others went ahead and integrated the modules but will teach them again next year in the right season.

All teachers used the guide as a teacher's manual -- not as a guide to develop their own materials. Most teachers are just too busy to write their own materials. Instead, they want a guide ready to use when they pick it up.

The guide was successful for those teachers who can work from suggestions, but those who needed more structure needed more details. Most requested more teaching aids, such as transparencies, slides, tapes, and

more accessible children's materials. Few of the teachers had an agricultural background; therefore, they were hesitant about teaching the module. However, most teachers after assessing their educational backgrounds felt comfortable in developing the activities. They were very flexible in adapting modules to various grade levels and were able to identify related occupations when substitutes were required.

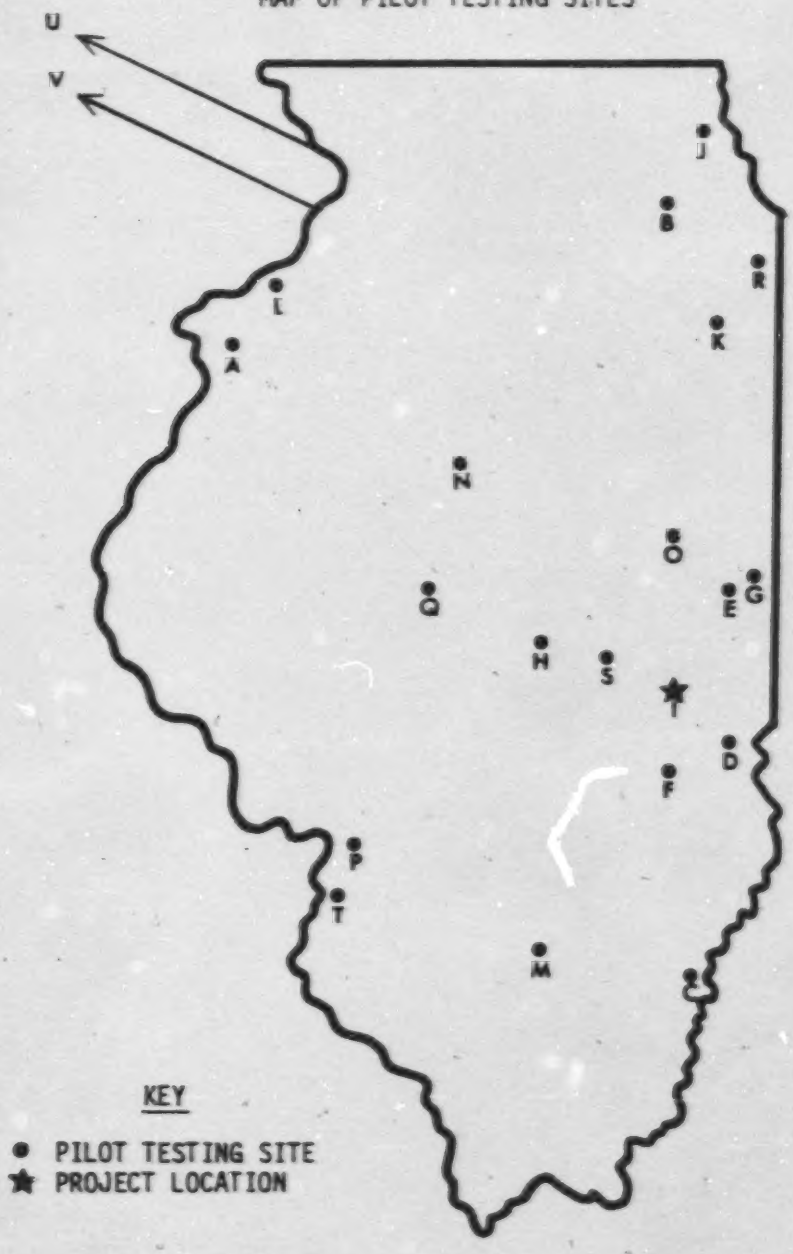
FIGURE 17

Name of School District and Name of Pilot School	Population	Student Population	Socio-Economic Classification: Rural	Suburban	Urban	Upper	Middle	Lower	Number of Pilot Teachers
A. Aledo Community Unit School District No. 201	8,000	1,477	x				x		1
Apollo School		376	x				x		1
B. Aurora West Unit School District No. 129	35,000	10,670			x	x	x	x	8
Nicholson School	3,000	326			x		x	x	8
C. Carmi Community Unit School District No. 5	8,750	1,939	x						2
Washington Junior High	8,750	485	x						2
D. Casey Community Unit School District C-1	5,000	1,250	x				x		3
Monroe School		390	x				x		1
Roosevelt School		200	x				x		1
Casey Junior-Senior High School		558	x				x		1
E. Catlin Community Unit School District No. 5	2,700	939	x				x		1
Catlin Elementary School		636	x				x		1
F. Cumberland Community Unit School District No. 77	6,500	1,426	x				x		8
Cumberland Elementary and Junior High		950	x				x		8
G. Danville Community Consolidated School District No. 118	45,000	9,801			x		x		4
Elmwood School		210			x		x	x	1
Garfield School		455			x		x	x	1
Washington School		475			x			x	1
East Park Junior High		893			x		x		1
H. Decatur School District No. 61	90,000	19,489			x		x		3
Roach School	4,454	500			x		x		3
I. Eastern Illinois University Buzzard Laboratory School						x			1
J. Highland Park School District No. 108	17,500	3,066		x		x	x		1
Lincoln School		469		x		x	x		1
K. Kankakee School District No. 111	45,000	9,475	x		x	x	x		2
Aroma Park School		305	x		x	x	x		2
L. Moline Unit School District No. 40	52,000	11,720			x		x		1
Logan School	1,800	448			x		x		1

FIGURE 17 (continued)

Name of School District and Name of Pilot School	Population	Student Population	Socio-Economic Classification: Rural	Suburban	Urban	Upper	Middle	Lower	Number of Pilot Teachers
M. Mt. Vernon School District No. 80	16,600	2,279			x		x		13
Edison School	2,000	223			x			x	13
N. Pekin School District No. 108	35,000	5,800			x	x	x		1
Sunset Hills School	2,500	343			x	x	x		1
O. Rantoul City Schools District No. 137	28,600	3,497			x		x		2
Broadmeadow School		462			x		x		1
Pleasant Acres School		571			x		x		1
P. Roxana Community Unit District No. 1	15,000	3,568		x	x		x		1
Rosewood School	7,000	560		x			x		1
Q. Springfield School District No. 186		22,120		x			x		1
Wanless Elementary School		310		x			x		1
R. Steger School District No. 194	20,000	2,575		x			x		5
Hickory Hill School	1,000	215		x			x		1
Saukview School	6,500	521		x			x		1
Central Junior High School		532		x			x		3
S. Sullivan Community Unit District No. 300	6,300	1,401	x				x		9
Lowe Elementary School		318	x				x		3
Powers Elementary School		306	x				x		3
Sullivan Junior High School		403	x				x		3
T. Venice Community Unit School District No. 3	3,300	644			x			x	2
Venice Elementary School		454			x			x	2
U. Wilder School District Wilder, Idaho	2,320	580	x				x		2
Holmes Elementary School		302	x				x		2
V. Parma School District Parma, Idaho	4,140	1,035	x				x		2
Parma Elementary School		499	x				x		2

FIGURE 18
MAP OF PILOT TESTING SITES



NOTE: See Figure 17 for community names.

FIGURE 19

CONFIGURATION OF PILOT TESTING - ELEMENTARY

MODULE	COMPLETED	ONLY PARTS COMPLETED	EVALUATION ONLY	GRADES							SPECIAL READING
				K	1	2	3	4	5	6	
Peanut Butter Maker	11		2	3	6	3	1				
Environmental Inspector	3				1	1					1
Park Ranger Naturalist	3				2	1					
Agronomist	5	1			4	2					
Florist	8		1		1	4	2	2			
Entomologist (Incorporated into new Module - Truck Farmer)	2					1	1				
Forest Technician		1					1				
Farm Equipment Mechanic	3					2	1				
Christmas Tree Farmer	4	1	1			1		4		1	
Environmental Technician (noise)	2							1		1	
Irrigation Engineer			1							1	
Horse Breeder (Incorporated into new Module - Livestock Producer)	4								2	2	
Greenskeeper		1						1			
Feed Sales Personnel	2	2							3	1	
Dairy Processing Equipment Operator (cheese)	1										1
Fish Culturist	3							2	1		

FIGURE 20

CONFIGURATION OF PILOT TESTING - JUNIOR HIGH

MODULE	COMPLETED	ONLY PARTS COMPLETED	EVALUATED ONLY	GRADE 7	GRADE 8	GRADE 9	COMBINATIONS OF 6, 7, 8, and 9	LANGUAGE ARTS CLASS	MATHEMATICS CLASS	SCIENCE CLASS	SOCIAL STUDIES CLASS	AGRICULTURE CLASS	CAREER EDUCATION CLASS (CLASSROOM TEACHER SPECIALTY)
AGRICULTURAL PRODUCTION													
AGRICULTURAL SUPPLIES AND SERVICES													
AGRICULTURAL EQUIPMENT AND MECHANICS		1			1							1	
AGRICULTURAL PRODUCTS (FOOD PROCESSING)		6		2	1		3						Language Arts - 1 Counselors - 2 Science - 1 Spanish - 1 Business - 1
ORNAMENTAL HORTICULTURE		1			1							1	
RENEWABLE NATURAL RESOURCES		1	1				2			1	1		
FORESTRY													
ENVIRONMENTAL PROTECTION	1	1	1	1	1		1	1		1			Counselor - 1

GENERAL RECOMMENDATIONS

After assessing the data gathered, the following are recommendations:

1. Provide additional field testing time during the fall and spring rather than winter.

2. Provide at least one day of inservice training for all participating field testers in order to help teachers feel more comfortable when teaching about occupations that are unfamiliar to them. If the materials are to be used in an urban or suburban area, teachers need to be made aware of the value of introducing agricultural occupations to city children.

3. Conduct evaluations of the impact of the materials on the students as well as the teachers.

4. If the teachers are to teach directly from these guides, additional instructional materials could be included in the guides such as pages for transparencies, slides, tapes, etc.

5. Provide an inservice package of materials to accompany the guide for use by individual schools wishing to implement career education via the Agribusiness, Renewable Natural Resources, and Environmental Protection clusters. For example:

   a. Film -- The Kingdom of Could Be You, Agribusiness #3313, Encyclopedia Britannica Educational Corporation, Chicago, Illinois.
   b. Sample activities concerning Career Development.
   c. Sample activities concerning occupational information.
   d. Sample activities showing the relevance of subject matter.
   e. Sample infused activities.
   f. Sample student evaluation activities.

6. If the teachers are to teach from this guide rather than develop their own modules, additional modules need to be written.

7. If the teachers are to develop their own materials from this guide, there is a need to develop or incorporate information on "How to Develop Career Education Modules."

8. All of the junior high school modules need to be field tested in their entirety. In order to do this, the materials need to be in the hands of the field testers early in the school year and left for a longer period of time than that allocated during the initial field testing.

9. Contact commercial publishers for possible commercial publication of these two guides since we have had inquiries to purchase them for use in the classroom.

PRESENTATIONS

During the course of this project, this staff was called upon to present Career Education lectures to a number of university classes, community organizations, school districts, and field testing sites. It was with great pleasure that we could introduce the concept of Career Education and two of its parts, mainly the cluster area for which we were developing curriculum guides and the career development concepts which would be infused into our modules.

The most important presentation will be given at The Ohio State University, Columbus, Ohio, May, 1974, to representatives of each of the state departments of education for the purpose of disseminating the curriculum guides to personnel in their states for further use.

Other presentations given throughout the past year were given to

Eastern Illinois University classes:

1. Education Psychology and Instructions Task in the Secondary School
   Secondary Education, Undergraduate, two classes.
2. Directing Learning in the Elementary School
   Elementary and Junior High School Education, Undergraduate, two classes.
3. Innovations in Industrial Education
   Industrial Arts Education, Graduate.
4. Business Education in Career Education
   Business Education, Graduate.
5. Career Education in the Elementary School
   Elementary and Junior High School Education, Graduate.
6. Administration and Supervision of Programs in Occupational Education
   Business Education, Guidance Education, Health Education, Home Economics, and Industrial Arts Education.
7. Literature of Science and Technology (Agricultural Division)
   Library Science, Graduate.

University of Illinois classes:

1. Workshop in Curriculum Development in Career Education
   School of Education, Graduate.

Organizations:

1. Decatur Association for Childhood Education, Decatur, Illinois.
2. National Association of Supervisors of Agricultural Education and the American Association of Teacher Educators in Agriculture. AVA Convention, Atlanta, Georgia.
3. Multi-County Teacher's Institute, Charleston, Illinois.
4. League of Women Voters Radio Program on WEIC-AM, Charleston, Illinois.

Schools:

1. Career Education Coordinators for the State of Connecticut.
2. Career Education Workshop for Elementary and Junior High School Teachers, Franklin, Illinois.
3. Career Education Workshop for Elementary Teachers and Guidance Staff of the East St. Louis, Illinois, School District.
4. Career Education Workshop for Elementary Teachers in Carbondale, Illinois.

Presentations to Field Testing Site Participants:

1. Danville, Illinois.
2. Mt. Vernon, Illinois.

Consultant Services:

1. Ad Hoc committee for the Enrichment of Teacher and Counselor Competencies in Career Education, USOE funded project, Eastern Illinois University, Charleston, Illinois.
2. Macon County Educational Service Region, Macon County, Illinois.
3. Cumberland School District, Toledo, Illinois.
4. National Instructional Television, Bloomington, Indiana.
5. Committee to plan Programs of Teacher Education for Career Education, School of Education, Eastern Illinois University, Charleston, Illinois.
6. Illinois Task Force on Occupations Relating to the Environment at Illinois State University, Bloomington, Illinois.

BUDGET FIGURES

SALARIES		
Director, Curriculum Development Specialist, Technical Assistants (3), and Secretary	$23,378.07	
CONTRACTUAL SERVICES		
Consultants (6)	900.00	
MATERIALS AND SUPPLIES		
Office Supplies, Telephone and Postage, and Duplicating and Production	2,137.17	
TRAVEL		
Project Staff and Consultant Travel and Per Diem	1,317.76	
SUBTOTAL		$27,733.00
OTHER RELATED COSTS		
Indirect Cost	$ 2,219.00	
TOTAL BUDGET ALLOWED FOR PROJECT		$29,952.00

APPENDIX A

FIELD TESTERS

NAME OF SCHOOL	NAME OF PILOT TESTERS	GRADE OR POSITION	MODULE TESTED	Completed	Completed Parts Only	Evaluated Only
Aledo Community Unit School District No. 201						
Apollo School	*Clute, Don	Counselor	Feed Sales Personnel		x	
Aledo, Illinois 61231		Grades K-8				
Principal: Melvin L. Larson						
Aurora West Unit School District No. 129						
Nicholson School	Burns, Howard	Grade 6				x
649 N. Main Street	*King, Beverly	Grade 2	Florist	x		
Montgomery, Illinois 60538	Law, Arlene	Grade 1	Peanut Butter Maker			x
*Principal: William J. Favero	*Mauck, Fleda	Grade 6	Feed Sales Personnel		x	
	*Maroney, William	Grade 5				x
	Richards, Jerolee	Grade 3				x
	Schoenberger, A.	Grade 4	Christmas Tree Farmer			x
	Woods, Carolyn	Grade 1	Peanut Butter Maker			x
Caldwell Canyon-owyhee School Service Agency						
Holmes Elementary School	Duke, Marietta	Grade 2	Agronomist	x		
Box 488	Shelby, Winona	Grade 4	Fish Culturist	x		
Wilder, Idaho 83676						
Parma Elementary School	Behrman, Janis	Grade 2	Florist	x		
Parma, Idaho 83660	Collins, Mary	Grade 1	Peanut Butter Maker	x		
*Pilot Testing Coordinator: Janet Thomas						
Carmi Community Unit School District No. 5						
Washington Junior High School	Corcoran, Joann	Counselor	Agricultural Products (Food Processing)		x	
301 West Main Street		Grade 8				
Carmi, Illinois 62821	*Wollin, Kenneth	Counselor	Agricultural Products (Food Processing)		x	
*Principal: James Taylor		Grade 7				

NAME OF SCHOOL	NAME OF PILOT TESTERS	GRADE OR POSITION	MODULE TESTED	Completed	Completed Parts Only	Evaluated Only
Casey Community Unit School District No. C-1						
Monroe School 4th and Monroe Streets Casey, Illinois 62420 Principal: John D. Shoot	Fitzpatrick, Gladys	Grade 1	Agronomist Park Ranger Naturalist	x x		
Roosevelt School Casey, Illinois 62420 Principal: John D. Shoot	Crandall, Faith	Grade 6	Horse Breeder	x		
Casey Jr.-Sr. High School 306 East Edgar Avenue Casey, Illinois 62420 Principal: Richard T. Egan *Pilot Testing Coordinator: Mary Bare	Hunter, Gerald W.	Agriculture Grades 8-12	Agricultural Mechanics Ornamental Horticulture		x x	
Catlin Community Unit School District No. 5						
Catlin Elementary School Fleming Street Catlin, Illinois 61817 Principal: E. H. Kennard *Pilot Testing Coordinator: June Collins	Homann, Caralee J.	Grade 1	Agronomist	x		
Cumberland Community Unit District No. 77						
Cumberland Elementary and Junior High School Rural Route 1 Toledo, Illinois 62428 Principal: Pat Smith Ass't. Principal: James F. Henry	Decker, Judith Garner, Margaret Rogers, Adeline Throneburg, Alice A. Yow, Patricia Lynn *Blade, Robert	Grade 4 Grade 4 Grade 1 Grade 3 Kindergarten Lang. Arts - 7	Christmas Tree Farmer Christmas Tree Farmer Agronomist Forest Technician Peanut Butter Maker Environmental Protection	x x x 	 x x x	

	Carrell, Gayle	Lang. Arts Grades 6-8	Agricultural Products (Food Processing)		x	
	Weissing, Rita	Science Grades 6-8	Renewable Natural Resources		x	
Danville Community Consolidated School District No. 118						
Elmwood School 122 Delaware Street Danville, Illinois 61832 Principal: Gerald Atkinson	Kennedy, Jane	Grades 2-3	Peanut Butter Maker	x		
Garfield School 1101 N. Gilbert Street Danville, Illinois 61832 Principal: Margaret Ward	Klamp, Jean	Grade 5	Horse Breeder	x		
Washington School 305 West Madison Street Danville, Illinois 61832 Principal: Ernest Blanden	Steidel, Richard	Grade 6	Environmental Technician (noise)	x		
East Park Junior High School 930 Colfax Street Danville, Illinois 61832 Principal: Harold J. Klaman *Pilot Testing Coordinator: Marion Hall	Kirkpatrick, Jewell	Grade 8	Ornamental Horticulture		x	
Decatur School District No. 61						
Roach School 1900 East Williams Street Decatur, Illinois 62521	Buttz, Pam	Grades 1-2	Peanut Butter Maker	x		
	*Newtson, Connie	Grade 1	Peanut Butter Maker	x		
	Scheiderer, Patricia	Grade 6	Irrigation Engineer			x
Eastern Illinois University						
Buzzard Laboratory School Seventh Street Charleston, Illinois 61920 Principal: Donald Gill	*Elliott, Betty	Grade 2	Entomologist	x		
			Environmental Inspector	x		
			Farm Equipment Mechanic	x		
			Park Ranger Naturalist	x		
			Peanut Butter Maker	x		

NAME OF SCHOOL	NAME OF PILOT TESTERS	GRADE OR POSITION	MODULE TESTED	Completed	Completed Parts Only	Evaluated Only
Gavin School District No. 37 1200 East Grand Avenue Ingleside, Illinois 60041	*Hill, Owen	Grades 7-8	Renewable Natural Resources	x		
Highland Park School District No. 108 Lincoln School 711 Lincoln Avenue W. Highland Park, Illinois 60035 Principal: Robert Altman	*Ergang, Florence	Grade 4	Environmental Technician (noise)	x		
Kankakee School District No. 111 Aroma Park School Box 126 Aroma Park, Illinois 60110 Principal: Lawrence Wier *Pilot Testing Coordinator: David LaMere	Lambert, Annette	Grade 2	Florist	x		
	*Raybon, Eddie	Grade 3	Florist	x		
Moline Unit School District No. 40 Logan School 1602 - 25th Street Moline, Illinois 61265 *Principal: Gwendolyn McBride	*Mitchell, Lucille	Grade 4	Christmas Tree Farmer	x		
Mt. Vernon School District No. 80 Edison School 521 Perkins Street Mt. Vernon, Illinois 62864 Principal: Vernon French	Chaney, Helen	Kindergarten	Peanut Butter Maker	x		
	Conner, Cheryl	Grade 2	Farm Equipment Mechanic	x		
	Gregory, David	Grade 5	Feed Sales Personnel	x		
	Grooms, Juanita	Reading	Environmental Inspector	x		
	Jones, Sandra	Grade 5 & Music	Fish Culturist	x		
	Lause, Nell	Grades 2-3	Entomologist	x		
	McIntosh, Joyce	Grades 3, 5, 6 Reading	Dairy Processing Equipment Operator (cheese)	x		
	Martin, Betty	Grade 1	Agronomist	x		
	Randall, Linda	Grade 1	Park Ranger Naturalist	x		
			Peanut Butter Maker	x		

	Rightnowar, Marvin	Grade 6	Horse Breeder	x		
	*Roderick, Margaret	Grades 2-3	Farm Equipment Mechanic	x		
	*Rohlfing, Gena	Grade 3	Florist	x		
	Yearwood, Steve	Grade 6	Christmas Tree Farmer	x		
Pekin School District No. 108 Sunset Hills School 1800 Highwood Pekin, Illinois 61554 Principal: Howard Hamra	*Brink, Dana	Kindergarten	Peanut Butter Maker	x		
Rantoul City Schools District No. 137 Broadmeadow School Sunview Drive Rantoul, Illinois 61866 Principal: Wilford Sanders	*Guettler, Jean	Grade 4	Florist	x		
Pleasant Acres School Short Street Rantoul, Illinois 61866 Principal: George Piland *Pilot Testing Coordinator: David Glisson	*Mullen, Miriam	Grade 1	Florist	x		
Roxana Community Unit District No. 1 Rosewood School 435 West Rosedale Drive East Alton, Illinois 62024 Principal: Russell G. Shaver	*Thielemann, Barbara	Grades 3-4				x
Springfield School District No. 186 Wanless Elementary School 2120 Reservoir Street Springfield, Illinois 62704 *Principal: Glenn Davis	Purdum, Mary	Grade 2	Agronomist	x		

NAME OF SCHOOL	NAME OF PILOT TESTERS	GRADE OR POSITION	MODULE TESTED	Completed	Completed Parts Only	Evaluated Only
Steger School District No. 194						
Hickory Hill School Chestnut Street Park Forest, Illinois 60466 Principal: Willma Royer	Simons, Virginia	Grade 2	Florist			x
Saukview School 34th and Miller South Chicago Heights, Ill. 60411 *Principal: Richard Goesel	Radice, Betty	Grade 5	Horse Breeder	x		
Central Junior High School 33rd and Emerald Steger, Illinois 60475 Principal: Ben S. Fletcher	Lale, Norman	Science Grades 7-8	Agricultural Production (Food Processing)		x	
	Olson, Rose	Grade 7	Agricultural Production (Food Processing)		x	
	Strickler, William	Grades 7-8	Agricultural Production (Food Processing)		x	
Sullivan Community Unit District No. 300						
Lowe Elementary School South Pierce Street Sullivan, Illinois 61951 Principal: James A. Johnson	Crawford, Marian	Grade 5	Feed Sales Personnel	x		
	Elder, Laura	Grade 4	Fish Culturist	x		
	Livergood, Katherine	Grade 4	Florist	x		
Powers Elementary School 208 Jackson Street Sullivan, Illinois 61951 Principal: James A. Johnson	*Boll, Sandy	Grade 2	Peanut Butter Maker	x		
	Nohren, Carolyn	Grade 2	Christmas Tree Farmer	x		
	Schaljo, Nancy	Grade 1	Peanut Butter Maker	x		
Sullivan Junior High School 713 North Main Street Sullivan, Illinois 61951 Principal: Antone Tepatti	Miller, Calvin	Grade 6				x
	Turner, Leland	Science	Environmental Protection			x
	Ward, Bill	Grades 7-8	Renewable Natural Resources			x

Venice Community Unit School District No. 3 Venice Elementary School 700 Broadway	Coltrell, Linda *Falwell, Georgia	Grade 7 Elementary Counselor	Environmental Protection Environmentl Protection	x x		

* Attended DVTE Career Education Workshop in 1972-73.
____ Pilot Testing Coordinator

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APPENDIX B

TEACHER STATISTICS

PERSONAL DATA OF PILOT TESTERS

FEMALE

Number: 49
Average Age: 36
Average Years of Teaching Experience: 11

Other Work Experience

Ad taker
Bookkeeper
Designing
Babysitting
Camp cook
Paper girl
Airline hostess
Bag factory worker
Cafeteria worker
Camp counselor
Candy maker
Clerk in pharmacy
Counter girl at theater
Credit adjuster
Dancing instructor
Data processing
Director of outdoor education program
Dormatory receptionist
Dress shop clerk
*Farming (3)
File clerk
Foreign missions
Homemaking
IBM tab operator
Home work with handicapped
Housekeeper
Laboratory assistant
Librarian
Library aid
Medical records transcriber
Medical technician
Nurse's aid
Photographer - clerk
Psychometrist
Rebuyer for catalog company
Receptionist for doctor
Shirt factory worker
Social work
Speech therapist
Stenographer
Teacher's aid
Telephone operator
Tutor
Secretary
Researcher
Dishwasher
Grill cook
Sales work

*Experience related to Agribusiness
Three teachers

MALE

Number: 14
Average Age: 31
Average Years of Teaching Experience: 8

Other Work Experience

Architectual drafting
*Beef herdsman
Bookkeeping
Brake press operator
Caddy
Cafeteria worker
Chemist
College mailroom worker
Construction worker
Delivery clerk
Factory worker
*Haybaling
Highway construction
Highway engineer technician
Landscaping
Minister
Paperboy
Postal employee
Road maintenance
Sales clerk
Timekeeper
Truck driver

*Experience related to Agribusiness
Two Teachers

ACADEMIC PREPARATION

OF

PILOT TESTING TEACHERS

College Majors:

Agricultural Education
Business Education
Chemistry
Elementary Education
English
French
Home Economics
Music
Physical Education
Science
Spanish
Special Art
Special Education
Social Studies
Zoology

Academic Preparation in	Number of Teachers
Guidance and Counseling	30
Industrial Arts	18
Vocational Education	13
Career Education	10

APPENDIX C

BIBLIOGRAPHY

BIBLIOGRAPHY

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TEACHERS UNIT _____

UNIT TITLE _____

REVIEWER'S NAME _____

DIRECTIONS FOR REVIEW

THE STATEMENTS BELOW PERTAIN TO THE COMPONENTS INCLUDED IN THE INSTRUCTIONAL UNIT. IF YOU DETERMINE THE COMPONENT IN THE UNIT MEASURES UP TO STANDARD AS STATED, PLACE A CHECK MARK (✓) IN THE YES MARGIN. WHENEVER YOU DETERMINE THAT THE COMPONENT OR A PORTION OF THAT COMPONENT IN THE UNIT DOES NOT MEASURE UP TO THE STANDARD DESCRIBED, PLACE A CHECK MARK (✓) IN THE NO MARGIN. WHENEVER A NO IS CHECKED, PLEASE DEFINE THE NATURE OF THE PROBLEM FOR THAT ITEM ON THE SECOND PAGE.

YES	NO	
		STUDENT PERFORMANCE OBJECTIVES
___	___	DEFINES ACCURATELY THE MAJOR SKILLS, KNOWLEDGE AND ATTITUDES REQUIRED FOR SUCCESSFUL ENTRY INTO THE OCCUPATIONS.
___	___	WRITTEN AT THE LEVEL WHICH WOULD GUIDE TEACHERS IN FORMULATING MORE SPECIFIC OBJECTIVES FOR THE LOCAL PROGRAM.
		INSTRUCTIONAL AREAS
___	___	THE CURRICULUM TOPICS STATEMENTS DEFINE ADEQUATELY AND ACCURATELY STUDY AREAS NECESSARY TO ACHIEVE THE COMPETENCIES NEEDED IN THE INDUSTRY.
___	___	THE CURRICULUM TOPICS AND CONCEPT STATEMENTS CLARIFY THE PURPOSE AND RATIONALE OF THE UNIT AND WOULD BE HELPFUL WHEN DEVELOPING SPECIFIC LOCAL CURRICULUM.
		EXAMPLES OF STUDENT LEARNING ACTIVITIES
___	___	PROVIDE EXAMPLES OF LEARNING EXPERIENCES WHICH WOULD CONTRIBUTE DIRECTLY TO ACHIEVING NECESSARY OCCUPATIONAL COMPETENCIES AND ARE REALISTIC FOR USE IN LOCAL PROGRAMS.
		INSTRUCTIONAL MATERIALS OR EQUIPMENT
___	___	THE MATERIALS OR EQUIPMENT ARE THOSE WHICH CAN BE PROVIDED TO THE STUDENT IN THE SCHOOL OR SUPERVISED WORK EXPERIENCE TO HELP THE STUDENT ACHIEVE THE OBJECTIVES AND TO PREPARE THE STUDENT FOR THE TYPE OF MATERIALS OR EQUIPMENT USED IN THE OCCUPATION.
		EXAMPLES OF PROCESSES TO EVALUATE STUDENT PERFORMANCE
___	___	THE STUDENT EVALUATION DEFINES APPROPRIATE MEANS TO DETERMINE HOW WELL THE STUDENT CAN ACCOMPLISH THE STATED OBJECTIVES. THE EVALUATION DEFINES MEANS FOR ASSESSING THE APPLICATION OF KNOWLEDGE.

STUDENT PERFORMANCE OBJECTIVES

OBJECTIVE NUMBER	NATURE OF THE PROBLEM

INSTRUCTIONAL AREAS

OUTLINE NUMBER & LETTER	NATURE OF THE PROBLEM

EXAMPLES OF STUDENT LEARNING ACTIVITIES

ACTIVITY NUMBER	NATURE OF THE PROBLEM

INSTRUCTIONAL MATERIALS OR EQUIPMENT

ITEM NUMBER	NATURE OF THE PROBLEM

EXAMPLES OF PROCESSES TO EVALUATE STUDENT PERFORMANCE

ITEM NUMBER	NATURE OF THE PROBLEM

CURRICULUM SPECIALISTS UNIT _____

UNIT TITLE _____

REVIEWER'S NAME _____

DIRECTIONS FOR REVIEW

THE STATEMENTS BELOW PERTAIN TO THE COMPONENTS INCLUDED IN THE INSTRUCTIONAL UNIT. IF YOU DETERMINE THE COMPONENT IN THE UNIT MEASURES UP TO STANDARD AS STATED, PLACE A CHECK MARK (✓) IN THE YES MARGIN. WHENEVER YOU DETERMINE THAT THE COMPONENT OR A PORTION OF THAT COMPONENT IN THE UNIT DOES NOT MEASURE UP TO THE STANDARD DESCRIBED, PLACE A CHECK MARK (✓) IN THE NO MARGIN.

WHENEVER A NO IS CHECKED, PLEASE DEFINE THE NATURE OF THE PROPLEM FOR THAT ITEM ON THE SECOND PAGE.

YES	NO	
		STUDENT PERFORMANCE OBJECTIVES
___	___	THE OBJECTIVES ARE STATED SO THAT IT IS CLEAR WHAT PERFORMANCE IS EXPECTED OF THE STUDENT, THE LEVEL OF PERFORMANCE EXPECTED, AND UNDER WHAT CONDITIONS THE PERFORMANCE IS EXPECTED.
___	___	THE OBJECTIVES ARE WRITTEN AT THE LEVEL WHICH WOULD BE COMMON TO PROGRAMS IN VARIOUS STATES AND STILL BE APPROPRIATE FOR STATE CURRICULUM SPECIALISTS AND LOCAL TEACHERS FOR PLANNING THEIR SPECIFIC CURRICULUM.
		INSTRUCTIONAL AREAS
___	___	THE CONTENT IS COMPOSED OF TOPICS DEFINING AREAS OF STUDY DIRECTLY RELATED TO THE ACHIEVEMENT OF THE OBJECTIVES AND IN A CONSISTANT FORMAT AND STYLE APPROPRIATE TO AIDING DEVELOPMENT OF STATE AND LOCAL CURRICULUM AND CURRICULUM MATERIALS.
___	___	THE CONCEPTS AND GENERALIZATIONS CLARIFY THE PURPOSE OR RATIONALE OF THE UNIT AND WOULD BE HELPFUL WHEN DEVELOPING MORE SPECIFIC STATE OR LOCAL CURRICULUM.
		EXAMPLES OF STUDENT LEARNING ACTIVITIES
___	___	THE STUDENT ACTIVITIES RELATE DIRECTLY TO THE OBJECTIVES. THEY CLEARLY DESCRIBE AN EXAMPLE OR EXAMPLES OF WHAT CAN BE DONE OR HOW STUDENTS CAN BE ACTIVELY INVOLVED IN ACTIVITIES WHICH AID IN THE ACCOMPLISHMENT OF THE OBJECTIVES.
		EXAMPLES OF PROCESSES TO EVALUATE STUDENT PERFORMANCE
___	___	THE STUDENT EVALUATION DEFINES APPROPRIATE MEANS TO DETERMINE HOW WELL THE STUDENT CAN ACCOMPLISH THE STATED OBJECTIVES. THE EVALUATION DEFINES MEANS FOR ASSESSING THE APPLICATION OF KNOWLEDGE.

STUDENT PERFORMANCE OBJECTIVES

OBJECTIVE NUMBER	NATURE OF THE PROBLEM
_____	_____
_____	_____
_____	_____
_____	_____

INSTRUCTIONAL AREAS

OUTLINE NUMBER & LETTER	NATURE OF THE PROBLEM
_____	_____
_____	_____
_____	_____
_____	_____

EXAMPLES OF STUDENT LEARNING ACTIVITIES

ACTIVITY NUMBER	NATURE OF THE PROBLEM
_____	_____
_____	_____
_____	_____
_____	_____

EXAMPLES OF PROCESSES TO EVALUATE STUDENT PERFORMANCE

ITEM NUMBER	NATURE OF THE PROBLEM
_____	_____
_____	_____
_____	_____
_____	_____

INDUSTRY REPRESENTATIVES UNIT _____

UNIT TITLE _____

REVIEWER'S NAME _____

DIRECTIONS FOR REVIEW

THE STATEMENTS BELOW PERTAIN TO THE COMPONENTS INCLUDED IN THE INSTRUCTIONAL UNIT. IF YOU DETERMINE THE COMPONENT IN THE UNIT MEASURES UP TO STANDARD AS STATED, PLACE A CHECK MARK (✓) IN THE YES MARGIN. WHENEVER YOU DETERMINE THAT THE COMPONENT OR A PORTION OF THAT COMPONENT IN THE UNIT DOES NOT MEASURE UP TO THE STANDARD DESCRIBED, PLACE A CHECK MARK (✓) IN THE NO MARGIN. WHENEVER A NO IS CHECKED, PLEASE DEFINE THE NATURE OF THE PROBLEM FOR THAT ITEM ON THE SECOND PAGE.

YES	NO	
		STUDENT PERFORMANCE OBJECTIVES
___	___	THE OBJECTIVES DEFINE THE SKILLS, KNOWLEDGE AND ATTITUDES WHICH ARE NEEDED FOR SUCCESSFUL ENTRY INTO THE OCCUPATIONS.
		INSTRUCTIONAL AREAS
___	___	THE CONCEPT DEFINES THE IMPORTANT UNDERSTANDING OF THE AREA COVERED IN THE UNIT AND THE STUDY AREAS DEFINED BY THE CONTENT TOPICS ARE APPROPRIATE FOR ACQUIRING SKILLS, KNOWLEDGE OR ATTITUDES WHICH WILL ACHIEVE THE STATED OBJECTIVES.
		EXAMPLES OF STUDENT LEARNING ACTIVITIES
___	___	THE STUDENT ACTIVITIES ARE APPROPRIATE EXAMPLES OF HOW A STUDENT MAY BE INVOLVED IN LEARNING ACTIVITIES THAT WILL ACHIEVE THE OBJECTIVES IN A REALISTIC MANNER.
		INSTRUCTIONAL MATERIALS OR EQUIPMENT
___	___	THE MATERIALS AND EQUIPMENT ARE REALISTIC OR APPROPRIATE TO USE IN PREPARING THE STUDENTS FOR THE EMPLOYMENT KNOWLEDGE AND SKILLS.
		EXAMPLES OF PROCESSES TO EVALUATE STUDENT PERFORMANCE
___	___	THE PERFORMANCES IN THE STUDENT EVALUATION ARE APPROPRIATE TO THE TYPE AND LEVEL OR QUALITY OF PERFORMANCE WHICH IS REALISTIC TO THAT NEEDED AT ENTRY LEVEL IN THE OCCUPATION.

STUDENT PERFORMANCE OBJECTIVES

OBJECTIVE NUMBER	NATURE OF THE PROBLEM

INSTRUCTIONAL AREAS

OUTLINE NUMBER & LETTER	NATURE OF THE PROBLEM

EXAMPLES OF STUDENT LEARNING ACTIVITIES

ACTIVITY NUMBER	NATURE OF THE PROBLEM

INSTRUCTIONAL MATERIALS OR EQUIPMENT

ITEM NUMBER	NATURE OF THE PROBLEM

EXAMPLES OF PROCESSES TO EVALUATE STUDENT PERFORMANCE

ITEM NUMBER	NATURE OF THE PROBLEM

Please return this form to the Ohio Career Education and Curriculum Management Laboratory in Agricultural Education, Room 250, Agricultural Administration Building, The Ohio State University, Columbus, Ohio 43210.

The persons named below have been nominated for the state of _____ to attend the Seminar in Columbus, Ohio, May 13 - 17, 1974.

If no personnel from your state can attend, would you please indicate this. This will affirm that this is the intent rather than an oversight in returning the request form.

Name of Nominee _____
Position or Title _____
Complete Mailing Address _____
_____
_____ Phone _____

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Position or Title _____
Complete Mailing Address _____
_____
_____ Phone _____

The National Seminar on Dissemination of Curriculum Guides
for Agribusiness, Natural Resources and Environmental Protection
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ON DISSEMINATION OF CAREER EDUCATION

CURRICULUM GUIDES IN AGRIBUSINESS,

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NATIONAL CONFERENCE ON DISSEMINATION

OF CAREER EDUCATION CURRICULUM GUIDES IN

AGRIBUSINESS, NATURAL RESOURCES, AND ENVIRONMENTAL PROTECTION

May 13 - 17, 1974

Fawcett Center for Tomorrow
The Ohio State University
Columbus, Ohio

THE PROGRAM

MONDAY, MAY 13

Morning:

9:00	Registration	

Afternoon:

1:30	Welcome	Dr. Ralph E. Bender, Chairman, Agricultural Education The Ohio State University
1:35	Transitions in Agricultural Education	James E. Dougan, Director Agricultural Education Service Department of Education Columbus, Ohio
1:50	Setting Goals for the Seminar	Dr. Floyd McCormick, Chairman, Agricultural Education University of Arizona
2:20	Principles of Curriculum Development	Dr. Byrl Shoemaker, State Director, Vocational Education, Ohio Department of Education
3:00	The Nature of the Project	Roger D. Roediger, Project Director, and Dr. Harlan E. Ridenour, Project Administrative Director, Career Education in Agribusiness, Natural Resources, & Environmental Protection

3:30	Afternoon Break	
3:40	Curriculum Guides for Career Education, K-6 and 7-9	Dorothy Lawson, Project Director, K-9 Career Education Guides, Eastern Illinois University
4:30	Adjourn	

TUESDAY, MAY 14

Morning:

8:30	Career Education in Agribusiness for K-6 and 7-9	Dorothy Lawson
9:20	Curriculum Change Agents in Career Education	Dr. Robert Kerwood, State Director of Professional & Curriculum Development, Arizona
9:40	Career Exploration in Local Programs	Nicholas Topougis, Coordinator, Career Education, Akron Public Schools, Ohio
10:00	A Local Teacher Uses the K-6 Guides	Betty Elliott, Primary Teacher, Eastern Illinois University
10:20	Morning Break	
10:30	Discussion Groups	
11:00	Question & Answer Session	
11:30	State Planning Session for K-9	State Participants

Lunch

Afternoon:

1:00	The Place of the Agribusiness Project within the Cluster Curriculum	Dr. Elizabeth J. Simpson, Director, Curriculum Center for Occupational & Adult Education, U.S. Office of Education, Washington, D.C.

1:40	The Vocational Preparation Guides	Roger D. Roediger, Project Director
2:10	Staff Presentations of the Curriculum Guides	Larry D. Householder Max B. McGhee Eddie A. Moore Edgar P. Yoder, Project Staff, Career Education in Agribusiness, Natural Resources and Environmental Protection
3:00	Afternoon Break	
3:15	Adapting the National Curriculum Guides to State Curriculum Efforts	Robert Patton, Assistant Coordinator, Curriculum & Instructional Materials Center, Oklahoma State Department of Vocational & Technical Education
3:45	Development of Instructional Materials: Production Agriculture	G. Don Glazier, Jr., Curriculum Materials Specialist
4:00	Development of Instructional Materials: Youth Leadership	Tom Harp, Curriculum Materials Specialist
4:10	How a Teacher Has Used the Environmental Protection Guide	Gary Bambauer, Environmental Science Instructor, Montgomery County Joint Vocational School, Clayton, Ohio
4:30	Adjourn	

WEDNESDAY, MAY 15

Morning:

8:30	Using the Curriculum Guides for In-Service Curriculum Development	Dr. Donald E. McCreight, Head, Department of Agricultural Education, University of Rhode Island

9:00	The Place of Production Agriculture in Our Expanded Programs	Dr. Max Amberson, Chairman, Agricultural & Industrial Education Department, Montana State University
1:30	Implementing Specialized Agribusiness Programs	Ohio Agricultural Education Supervisors: James Dougan, Director Welch Barnett Richard Hummel Earl Kantner John Starling John Morgan James Watkins
10:15	Morning Break	
10:30	Curriculum Management at the Local Level	Dr. Darrell Parks, Assistant Superintendent - Instructional Management, Greak Oaks Joint Vocational School District, Cincinnati, Ohio
11:00	Discussion Groups	
11:30	Question & Answer Session	

Lunch

Afternoon:

1:00	Advisory Committees and Industry Cooperation in Agricultural Supplies and Services	George G. Greenleaf, Ohio Grain, Feed & Fertilizer Association, Inc. Columbus, Ohio
1:30	Updating Agricultural Equipment and Mechanics to Meet Industry Needs	William Davidson, Farm & Farm & Power Equipment Retailers of Ohio, Columbus
1:50	Programs for Preparing Teachers of Specialized Programs	Dr. Leon W. Boucher, Professor, Agricultural Education, The Ohio State University

2:10	Supervising In-Service Education of Teachers from Industry	Dr. Wayne Asche, Assistant Professor, Agricultural Education, Kent State University
2:30	The Application of Fair Labor Standards Act to Specialized Agribusiness Programs	George N. Kastor, Compliance Officer, U.S. Department of Labor, Employment Standards Administration, Wage & Hour Division, Columbus, Ohio
3:00	Afternoon Break	
3:15	Discussion Groups	
3:45	Question & Answer Session	
4:15	Tour Plans and Adjourn	Linda Keilholtz, Supervisor, Career Development, Division of Vocational Education, Ohio State Department of Education

THURSDAY, MAY 16

Morning:

7:00	Breakfast	
7:30	School Tours:	Southwestern Schools - K-10 Programs 10-12 Programs - Montgomery County Area Vocational Center & Eastland Area Vocational Center
6:00	Country Dinner Playhouse	"Butterflies are Free"

FRIDAY, MAY 12

Morning:

8:30	Conducting State Occupational Needs Survey	Dr. Charles C. Drawbaugh, Chairman, Department of Vocational-Technical Education, Rutgers University

9:00	Orientation for State Planning Session	Staff
9:10	State Planning Session for Implementing Vocational Guides	State Participants
11:00	Where Do We Go From Here? Summary	Paul M. Day, State Supervisor, Agriculture Education, Department of Education, Minnesota
11:30	Reimbursement Plans and Check Out	

Lunch